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NUMBER 1.

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Telephony.

AN ILLUSTRATED MONTHLY TELEPHONE JOURNAL

VOL. VII. CHICAGO, JANUARY, 1904. No. 1.

Complete Report of the Third Annual Interstate Convention

The third annual convention of the Inter-State Independent Telephone Association was held in the banquet room of the Auditorium Hotel, Chicago, Illinois, December 8, 9 and 10, 1903.

FIRST SESSION—DECEMBER 8, 1903.

The convention was called to order by President C. E. Hull, of Salem, Illinois, shortly after 2 o'clock p. m., who said: Gentlemen, the hour has arrived when we should begin the active work of this convention. We have with us this afternoon Mr. Jones. It will not be necessary to give you any further particulars, as you all know him. He has a few remarks to make. (Applause.)

Mr. Frank H. Jones:

Mr. President and Gentlemen of the Inter-State Independent Telephone Association: I was walking up and down in the hallway there in my usual harmless way, a few minutes ago, when Brother Farwell of Bloomington tackled me and said: "We want you." I asked him for his warrant and power of attorney, etc. He said he didn't have anything of that sort. He said he wanted me to come up here. I had been spending the last fifteen or twenty minutes since I had my lunch in dodging people who wanted to put badges on me, or otherwise adorn me, and for no other apparent reason than that I was very badly in need of a shave. So I have come here absolutely and honestly to give you some impromptu remarks. As I was never very good at making impromptu remarks I am going to omit them.

I am here for just one purpose, and that is to introduce to you a representative of the mayor of the city of Chicago, Mr. Levy. He will tell you how glad he is that we are here—we know that, of course, before he starts out—but he is going to tell us how fine we are, how wonderful we are, that we are doing good, and all that sort of thing. I don't know how many of you gentlemen here are democrats, but you are probably aware of the fact that we have a good democratic mayor here in Chicago, and if there are any good, loyal democrats left here in the room, I hope that certainly they will give him a very hearty welcome.

I bespeak for him the reception due to the mayor of the city, who is unable to come here to-day, and introduce to you Mr. Levy, representing the mayor. (Loud applause.)

HENRY A. BARNHART.

Mr. David R. Levy:

Mr. Chairman and Gentlemen of the Association: I have the extreme honor and pleasure of representing here to-day our honored mayor, Mr. Carter H. Harrison. He has unfortunately been unable to be present at this time, owing to an illness in his family which necessitates him only coming down to attend to his absolutely necessary duties, and attending no functions whatever. It has been this unfortunate circumstance which has bestowed upon me this pleasure and honor.

Unfortunately, Mr. Jones has stated about all I was going to say. It is not fair to steal another fellow's thunder, but he has done it. That is, in regard to telling you about the good things you are doing, the good things you are going to do and the good things you ought to do.

But, in all seriousness, gentlemen. I think your meeting here is very appropriate from the fact that I learned that this association was called together or perhaps founded originally by Chicago men. This I understand is your third convention in our city and I wish to say for Chicago's mayor and for the city itself and its citizens, they want you to continue to meet here and hold all your meetings here. You represent the independent element in business. It is the independent element in business in these days which unfortunately is kept in the background. Vast aggregations of capital are controlling almost every line of business. The small business man is either pressed into a corner or out of business, and I wish to compliment you, gentlemen, representing as you do industries in nine great commonwealths of this country, on the strides that you have made, independent of these aggregations of capital, and, in fact, against one of the largest capitalized institutions in this country to-day.

I have had the good fortune to know a little about how the Independent telephone men have climbed to the top. I lived a number of years ago in Indiana, which as I understand has become the hot-bed of the Independent telephone business. I met a telephone operator there who started independently, who has since become very successful as I understand. I do not see him among you, but he will probably be here—and that is Mr. P. C. Burns. And he predicted to me (that was ten years ago, gentlemen) that the Independent telephone operators would one day control the telephone business. Whether this is true or not, the future will only tell. I do not attempt to prophesy, as I am not in the business and am not here for that purpose, but I want to say that the

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independent spirit that you represent is the one that Chicago fosters. Chicago stands for it and has grown from a small city to a vast metropolis. You have grown from two or three men fighting a gigantic monopoly to where you are a recognized business in the commercial world.

I want to say to you that I wish you every success and prosperity, and, in behalf of the mayor of the city of Chicago, to offer you its freedom; and I want to say in this connection that if you get into any trouble of any kind or nature while you are here, even at this date, even now, you can call up either the police department or the mayor's office on an Independent telephone and they will probably come to your assistance. (Applause.)

As I think I hear now the busy signal, and it is time to ring off, I simply want to repeat that, in behalf of the mayor of this city and in behalf of its citizens, we offer to you our welcome, and we wish to say that it is our request and desire that every meeting of the Independent Telephone Association will be held in Chicago, and that the time will come that your meetings will be so large that you will have the Auditorium theater instead of the banquet hall. I thank you. (Applause.)

President Hull: I desire at this time to thank the mayor, through his representative, for the kind and courteous welcome that he has given us and to assure him that there is but one thing that stands in the way of our continued meetings in the city of Chicago, and that is to induce the Independent telephone company, of which he has made mention, to connect up with all the varied interests that are represented here, so that when we come here for our meetings we may be able to talk to our own homes over our own Independent lines. (Applause.) That, gentlemen, and that Mr. Levy, as the representative of the mayor of Chicago, is the only thing that stands in the way of our coming here all the time from now on.

Secretary Coleman: Mr. Chairman, I want to make a motion that there be a committee appointed whose duty it shall be to draft appropriate resolutions on the death of Hon. H. C. Raney of Iowa, president of this association and convention in 1902, his death having occurred since our last annual convention. If I can meet with a second?

Mr. L. A. Frezee (Connersville, Ind.): I second the motion.

President Hull: It has been moved and seconded that a committee be appointed to draft suitable resolutions on the death of our ex-president, Henry C. Raney of Iowa. Are there any remarks? If not, those in favor of the motion will signify the same by saying aye.

The motion was unanimously carried.

President Hull: I will appoint on that committee our secretary, Mr. E. M. Coleman, Louisville, Kentucky; Dr. H. S. Herr, Ottumwa, Iowa; and Mr. L. A. Frazee, Connersville, Ind.

President Hull:

It now becomes my pleasure and duty to call to order this, the third annual meeting of the Inter-State Independent Telephone Association and address you. We meet to-day in the city of our birth under auspicious circumstances. The growth of our movement as an association has been phenomenal. It is to our glory that we have brought together in a common fraternity, men engaged in a common calling and laboring for the same noble end. Throughout the states that we represent we know each other as never before. As my lamented predecessor well said of us individually, "We are of the people; our business had its origin in the needs of the people and in their efforts to supply these needs. It is for this reason that the Independent telephone movement has always had the moral as well as the financial support of the public. In this fact we find the secret of past success and the guaranty of future greatness."

What is true of us as individual operating companies is true of us as an association and will continue so if judicious common sense prevails.

The work that should be done in the three short sessions of this convention is of vast importance to us all. I urge prompt attendance upon all our deliberations and bespeak your very careful consideration of all business transacted. Nothing that is for our common weal should fail to receive our indorsement and earnest support, and nothing that militates against the general good of us all should escape our censure and denunciation.

The secretary, with the assistance of the other members of the committee, has prepared an excellent program on vital subjects. The papers presented for your consideration here have been carefully prepared by men thoroughly competent to exhaust the subject matter. Nevertheless, we expect to invite full and free discussion of all matters treated upon, either immediately following each number on the program or through the medium of the question box, as this body may determine. Ample provision has been made for your entertainment during the interim between sessions. In fact, everything has been done to make this convention both pleasant and profitable, as have been the two which preceded it. As a convention association, we have just cause to "toot our horns" and proclaim our success.

So much for one week in the year. What of the other fifty-one? Shall there be so much joy over the one week that the others are forgotten? No. Threatening clouds that have arisen within the past twelve months warn us that there is much work for us as an association and as individual operators as well. In order that the work in hand and to be taken up may be successfully maintained, we should at this meeting revise our constitution so that our field may be broadened and our association put on a solid financial basis. We should have well-equipped and permanent headquarters.

It is true, and pity it is, that, taken as a whole, Independent telephone investors have in a great degree lived each for himself. Feeling strongly intrenched in his own locality, the disposition has been to get all he could and keep all he got. This disposition upon the part of some of the large operating companies has driven from our ranks many who preferred to remain Independent operators. We need more business in our business.

Do not think, gentlemen of this association, that I am a pessimist. I am an optimist on most things, and especially on the future of Independent telephony. I want, however, to strongly urge upon you the great need of a solid association which will be of valuable assistance to all of its members every week and each day in the years to come. Plans for such an association may be matured by the committee which I hope may be appointed, on revision of the constitution.

We should, as has been suggested at former meetings, take up the question of a press committee. The press is the great educator of the age. It is a fact conceded even by our national enemies, that in no country in the world can you find a people to compare with the high standard of intelligence found among our own people—the common people, the wage earners, laborers, mechanics and artisans—people from whom we receive our patronage. The people in all quarters need to know the merits of the fight we are making. It is difficult to win against public sentiment, and I conceive it our duty to create and foster an aggressive sentiment in our favor, both as public benefactors and as an avenue for sound financial investment.

There have been numerous suggestions within the past year that this association adopt a distinctive national emblem for the Independent telephone, and I consider the matter worthy of the attention of this body.

Other matters of interest to this association are indicated by the official program. The subjects so suggested should have wise consideration and a careful, conservative course taken as to the adoption of any new plans and policies. An earnest effort should be made to incorporate into our constitution only such ideas as may carry our organization successfully through the breakers which sooner or later may confront us.

Before we take up the active work of the session, I want to congratulate the members of this association individually upon whatever successes have attended them since our last meeting and to assure them that whatever measure of success has come to this organization is due to the hearty co-operation of you all. (Applause.)

President Hull: The next matter on the program is the report of the secretary.

Secretary Coleman then read his report as follows:

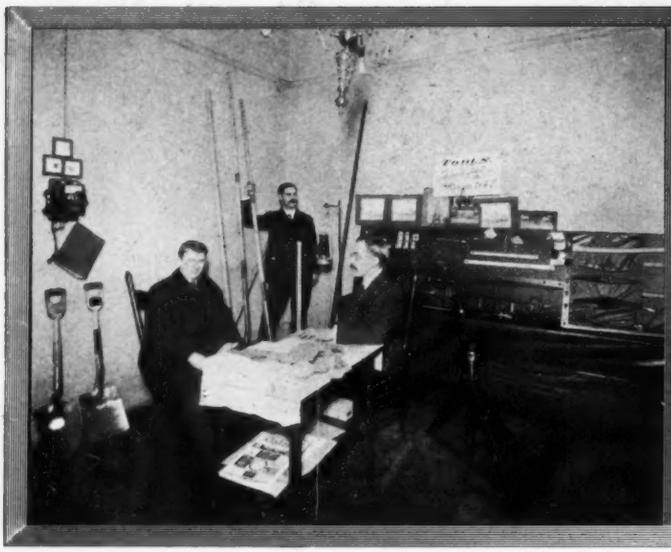
Your secretary is greatly indebted to President Hull and the officers and executive board for their support, assistance and co-operation during the past year, and especially so to the special committee on arrangements, composed of President Hull and Mr. O. Rex, who rendered valuable assistance.

The manufacturers and supply houses declined to aid us or take any action looking to the entertainment of this convention, as has been their custom heretofore. By reason of the decision of the manufacturers and supply houses not to entertain, all the work and expense preparatory to the holding of this convention and the entertainment of the delegates and guests necessarily devolved upon the secretary and the special committee.

The figures and data contained in this report are approximately correct. It is hoped that the following comparison will prove of interest, not only to the members of the Inter-State Association and the delegates here assembled, but to the financial and business world as well.

There are in the United States, according to the best information

BANQUET OF THE INTERSTATE INDEPENDENT TELEPHONE ASSOCIATION, AUDITORIUM HOTEL, CHICAGO, DECEMBER 10, 1903.



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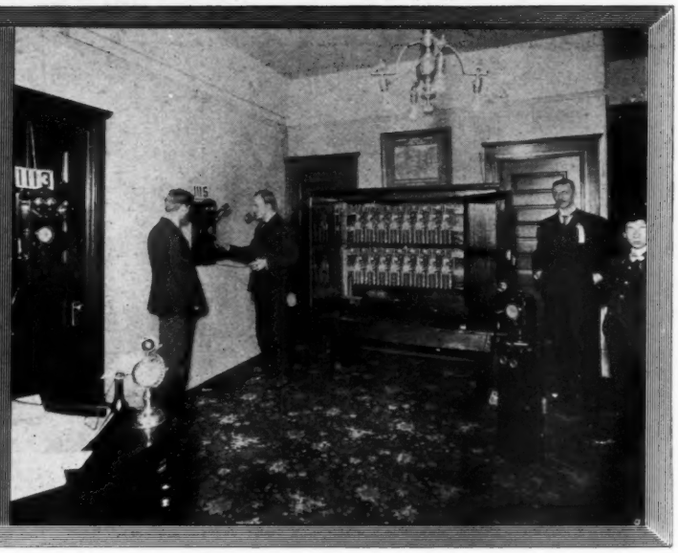


AUTOMATIC ELECTRIC COMPANY.

in possession of your secretary, exchanges of the Bell and Independents with a capitalization as shown by the following figures:

BELL EXCHANGES.

Capitalization of sub-companies	$373,583,609.00
American Tel. & Tel. Co. stock	131,628,200.00
American Tel. & Tel. Co. stock	28,000,000.00
Number of main exchanges	1,514
Number of branch offices	1,861
Subscribers, January 1, 1903	1,277,983
Capitalization, per subscriber	$417.00

INDEPENDENT EXCHANGES.

Invested capital (in round numbers)	$200,000,000.00
Number of main exchanges	6,150
Subscribers, January 1, 1903	2,000,000
Capitalization, per subscriber	$100.00

This estimate does not take into consideration the many rural companies, lines and small systems, aggregating at least 500,000 telephones actually in use.

There are in the United States one hundred and seventy-five cities, of a population of over 20,000, that now have Independent exchanges in operation. The earnings of the Independent companies in this country is best illustrated by the statements of twenty large companies during a period of four to five years, which show net earnings of from eight to sixteen per cent.

The growth of the Independent movement began in the Central, Northern and Middle States and has been phenomenal. To illustrate, eight years ago there were only between five to six thousand telephones of every kind in the state of Indiana. Now there are eighty thousand Independents and 22,000 Bell telephones in that state. Ohio, Pennsylvania, Iowa, Illinois and many other states show as great wonders.

During the last three years Independent telephony has enjoyed remarkable growth in the Eastern, Western and Southern States. Iowa, however, claims to be the banner Independent telephone state, having now over 1,200 Independent companies, to say nothing of several hundred local and farmers' systems. On the average there are from eighty to one hundred new Independent companies organized and incorporated each month in this country.

The Bell Telephone Company has spent millions of their ill-gotten gains in all sorts of schemes and endeavors to kill competition, with no apparent and lasting effect, except to bring bankruptcy to three of their largest sub or licensee companies, viz.: the Michigan, Central Union and Erie Systems.

During the convention year, 1903, there was edited and published, without cost to the association, an official hand book or convention book of eighty-four pages, containing the most important discussions and papers of the last convention. There was also prepared an official catalogue or program for the benefit of this convention. In accordance with the resolution adopted at the last convention, the paper read by Col. J. D. Power of Kentucky, subject, "Independent Telephone Securities From a Banker's Standpoint," was published in neat pamphlet form, and there are about 2,000 copies of this speech here, ready to supply to any one who wants them, 2,000 having already been distributed.

In addition to the two publications mentioned above, there were prepared, printed and distributed between eighty and 100,000 pieces of literature.

The cash received and distributed during this convention year cannot be known and reported before the close of this session, as is customary.

In submitting the annual report for the convention year, 1903, the statistics necessarily form a very small part of this communication, and events of the past year, together with the conditions of the present, all over the United States, combine to create the necessity of making some very pointed suggestions, which it is hoped and expected this convention will consider thoroughly.

During the past several years, especially during the early history of telephony in this country, sentiment has entered largely into the calculations of every man interested, and sentiment has worked wonders along some lines of the movement of Independent telephony. But, while sentiment may create or augment the inauguration of any movement, social, political or business, yet sentiment alone cannot maintain and sustain and give perpetuity to an enterprise that must be based necessarily upon a consideration of dollars.

Our last convention, in December, 1902, was certainly a great convention and was marked by considerable enthusiasm on the part of all concerned, and, while very many valuable papers were read and some matters of importance were discussed and some things of more or less moment determined, yet we did not bravely undertake to discuss and properly determine the vital questions that must be squarely met along our pathway of progress to success. And yet, perhaps the time was not then ripe, but since then has ripened for the more intelligent and deliberate considerations of the questions that must be determined now or in the near future.

Having kept in close touch with the Independent telephone movement in this country for several years past, and especially so during the last three years, we are profoundly impressed with the stupendous task before us, which should be approached and performed in a brave, intelligent and business-like manner. There are many problems we would like to shirk, evade or dodge, but they are of such a nature that they force themselves upon our minds and so impress our consciences that we must heed the warning that these intelligent contemplations bring to us, and act according to the dictates of our best judgments, or suffer the consequences, which can only prove in the end unwarranted sacrifices, lost opportunities and waste of time, energy and money.

We are contending against a regularly systematized and organized foe. It is an army trained and drilled through the past thirty years, and its exchequer was filled to overflowing with the spoils gained by its ravages of the public all over this country during those thirty years. And it is no wonder it proved arrogant and questionable in its methods of dealing with any one who should essay to claim existence in the same line of business. Up to this good hour the Independent telephone people of this country have been laboring separately and in scattered bands, the ultimate effect of which can only be compared to that of the marauding bands during times of war trying to contend with the great organized army.

To illustrate, the methods adopted by the Bell company during the first years of Independent telephony, as compared with the methods they are undertaking to practice now, should be sufficient to teach us a very practical lesson. They used to apply their energies to an effort to buy local Independent companies, and they frequently succeeded. This they did in the hope of ultimately demoralizing and weakening the movement, and we must admit that in a very large sense it had its effect, but the Independent exchanges

came so thick and fast, this method finally proved an impossibility, and the Bell people also discovered that when they would buy a local exchange in a small town, or even a large one, that immediately another Independent company would spring up and establish a system in the same place, so they discovered they were wasting money by this practice of buying the Independent telephone companies as they sprang up, so they bided their time for a while and waited until a cluster of towns in one particular section of the country would build up, and one of them would necessarily become the center of the cluster, and then they would, by some sneaking practice, purchase the center town or exchange of this little system, and thus render less valuable the surrounding exchanges. This method proved quite effective, too.

But still they could not stem nor still the tide. The Independent exchanges sprang up all over the land in every village, town and city, until to-day there are something like $250,000,000.00 invested in the United States in Independent exchanges, systems and toll lines, so that during the last two years new methods, new plans, new schemes and darker ways have been outlined, adopted and practiced by the cunning genius at the helm of the American Bell Telephone Company.

To-day their special mode of attack and warfare is performed in a very suave, pleasing, ethical and attractive manner, but the intent of the whole scheme is patent and potent to him who thinks. The attempt, while sly and cunning, is to get control of the toll business of this country and keep to it. They persuade some small exchange in some section of the country to connect with their toll lines, a thing they once refused to do, and, through the influence of that neighborhood, get another, and then attempt to get others and others. They get the people bound up in contracts, so that when a man or company has the courage to build a toll line system and undertakes it, they find the people who should be their friends and who claim to have Independent exchanges, tied hand and foot, so that the small exchanges cannot prove feeders to the Independent toll lines.

But there is still another practice or scheme of the Bell Telephone Company that has developed during the last twelve months, but concocted long ago, which must and does prove more direful in its effects than any method it has yet adopted or attempted to practice on the unwary public. The bold, daring scheme to silently, yet certainly get control of the manufacturing interests of this country without stooping to individualize or point out those concerned is most audacious. To prove the statement here made, you all know what has happened. It is a published, conceded fact that one of the largest alleged Independent manufacturing plants in this country is now under the control and domination of the Bell Telephone Company, thus placing at a great disadvantage and inconvenience the people all over this country who had invested their money in the apparatus made by this concern, and the air is full of current reports that other manufacturing establishments are tainted and influenced, or in some way connected with the Bell Telephone Company. We do not say that these reports are true, but we do say, from the experience in the past, that we ought to know whether these reports have any foundation in fact, because the securities owned by every Independent telephone investor in this country are necessarily affected more or less by such transactions. Money is a great temptation. It corrupts and debauches, degrades and ruins, and ultimately paralyzes men in every walk of life, from the highest position in our general government down to the constable in some voting precinct.

The Bell Telephone Company, by the use of its millions, illy gained by extortion, have undertaken, and in some instances have succeeded, in tempting men in the Independent field, both operators and manufacturers, to sell their birth-rights and some have yielded to the temptation to better their own financial condition, regardless of the effect on the general public, or those who have invested along the same lines because of having faith in them.

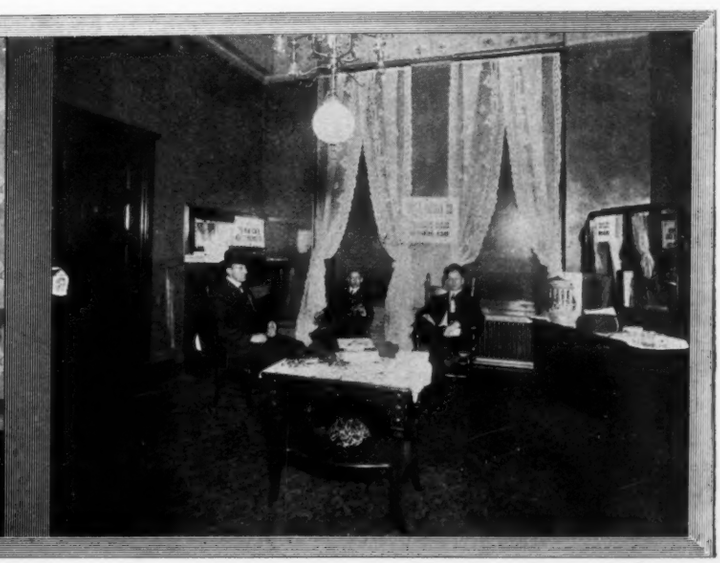
Hence your secretary respectfully suggests that these facts and conditions, both as regards the operator and the manufacturer, emphasize the imperative necessity that some system, plan or method of a solid, stable, business character, be devised and adopted and entered into heartily by the Independent people of the country, who are Independent at heart and in purpose, that would put us in closer business relations each with the other, and that would establish public confidence in the declaration that we are in this business to stay, regardless of bribe money or any other influence under heaven that can be exercised.

Business wisdom teaches us that systematic co-operation and legitimate combination, along practical lines, is imperative, so that it will be utterly impossible, legally, for any man or set of men to thwart the purposes or impede the progress of Independent telephony by selling his or their interests to any body or concern.

The Inter-State Independent Telephone Association was organized originally with an association of seven states; later two other states were added, making nine over which it asserted jurisdiction. The time has come and is already here when the jurisdiction and territory of this convention should be extended to cover the entire United States. The conditions demand it. The people demand it. The business demands it, and there can be no possible sentiment that can retard such action. There is no other organization to which the public can look. There is no other that is recognized as a progressive, live, active, energetic, effective organization. This organization is not and cannot be manipulated or run by any ring, or clique or set of men, but it is an organization of the people, and can accomplish wonders if but placed on the proper basis. Hence another suggestion that a committee should be appointed immediately to report back during the sittings of this convention, a plan upon which this association can be placed upon a financial business basis making it absolutely permanent, with definite practical ends to consummate.

So far, this association and hence its conventions, have been conducted on the lines of sentiment and enthusiasm, but now it is time to begin business of a practical, permanent nature, and it can only be accomplished, in my judgment, by the adoption of such plans as will place it on a permanent financial basis. And it is further suggested (and this necessarily grows out of the fact) that the headquarters of this association should be the general headquarters of the Independent telephone movement in this country, with the power delegated to it, under the direction of our executive board, to exercise general supervision and watch over the operating companies in this country; and a general information bureau should certainly be established, from which should be disseminated information of every sort calculated to build up the Independent telephone business in this country, and to counteract the malicious publications of our enemy. This headquarters should also constitute a kind of helping or fighting board, with the power to advise any one who gets into trouble, or assist any community, town or city where an honest attempt is being made to establish an Independent telephone system, or to thwart the purposes of the Bell Telephone Company in any part of the United States where it

W. J. BARR MANUFACTURING COMPANY.



F. BISSELL COMPANY.

CHICAGO TELEPHONE SUPPLY COMPANY. CHICAGO WRITING MACHINE COMPANY.

is undertaking to drive out or freeze out an Independent telephone system in order to gain advantage.

In other words, the headquarters of the association should be the reserve force to direct or aid in the progress of Independent telephony all over this country, and it should be the duty of the one in charge, aided by his associates, to know the facts as to all proposed or alleged Independent manufacturers, so that the public may not be duped into buying stuff really directly from the Bell company. Again, it is absolutely essential and necessary to adopt some systematic, practical plan or method to protect our investors, looking to the establishment of public faith in the safety and profitableness of the investments in Independent telephone securities, the result of which would be to permanently give such securities proper market value, such as they deserve according to their earning power. Again, that aggressive, wise, yet determined action along methodic business lines is absolutely necessary cannot be questioned when we realize that the Bell influence and tactics have found their way into some of the departments of our general government, through the chief head of that particular branch of the government of the United States.

But now to summarize or recapitulate the points in this report to which your attention is especially directed:

First: Sentiment and enthusiasm are essential elements in the conduct of any movement or enterprise, but ultimate success and perpetuity demand the introduction of other elements.

Second: The necessity of adopting co-operative plans, alliances and legitimate combinations to successfully and ultimately prevail over an organized competitive foe, and to protect our own interests and that of others against those alleged Independent operating companies and alleged Independent manufacturing concerns that have, or would sell us to the enemy, is absolutely imperative.

Third: The adoption of such co-operative business alliances as must assure and reassure capital and the general public of the profitableness and permanency of this legitimate business enterprise, phenomenal in its growth, popularity and usefulness, and to which we have devoted our most supreme energies, and for the success of which we have made so many sacrifices.

Fourth: The adoption of some feasible plan to insure the usefulness and perpetuity of the Inter-State Independent Telephone Association as an effective organization by placing it on a sound financial basis, thus enabling the complete consummation of definite ends. No organization can hope to perpetuate itself unless definite, profitable, essential ends are to be attained.

Fifth: That this association should be made the oracle, the recognized head and headquarters of the Independent movement in the United States in connection with which the departments of information, promotion, statistics, protection and standardization should be intelligently pushed.

Sixth: At least sufficient funds should be paid annually into the headquarters of this organization to properly compass the ends and aims contemplated in this report. Such an amount would enable the association to secure the entire time, energy and services of a thoroughly competent man to take charge of the headquarters and work, employ office help and develop the work of the various departments indicated, and all this could be done without burdening any one.

Action is urged for the specific ends to be attained, and the general good of Independent telephony.

President Hull: Gentlemen, you have heard the report of the secretary, together with the recommendations which it carries. What is your pleasure?

Mr. Barnhart (Indiana): I have a resolution which I wish to read.

Resolved, That the secretary's report be referred to a committee of three, to thoroughly investigate all recommendations with power to outline action and report back to this convention at the earliest hour possible.

Dr. Herr: Permit me to give you a second to that.

President Hull: For the information of the convention, I will ask that the resolution be again read, so that we can act.

The secretary then re-read the resolution.

President Hull: You have heard the resolution just read. Are there any remarks?

Mr. Bellamy (Iowa): Mr. Chairman, this paper that has been prepared by our secretary is a very able and what we might term an immediate paper, and if the recommendations that are therein contained should be carried out only in part, we have certainly made wonderful progress. I have no objections at all to Mr. Barnhart's motion, but it does seem to me that there are so many things that are new, and so many things that are of so vast importance to Independent telephony that the committee should be slightly enlarged. Different conditions obtain in different states to some extent, and I offer an amendment that the committee be increased, and that one representative be appointed from each of the states represented in this convention.

Mr. Thompson: I second the motion.

President Hull: You have heard the motion that the resolution should be so amended that the committee be enlarged to represent one member from each state represented in this convention. I would like to inquire if you mean by that from each of the nine states that compose this convention, or, if there are other states, whether they should be included?

Mr. Bellamy: The thought I had was the states that comprise the territory of this association.

President Hull: Well, while we have only nine states in the association there are representatives here from other states, but I presume that until they are officially admitted that they have no vote in this convention.

Mr. Bellamy: Mr. President, that was the thought that I had. Officially, we only represent a small territory, but if these recommendations were carried out we would represent a good big one.

Mr. Bandy (Iowa): It would be only an act of courtesy for them to meet this committee. They might learn something that would be of benefit to them.

President Hull: It has been suggested that the committee remain as it is, to consist of three, and that in its deliberations it invite a representative from each state, or as many representatives as desire to be heard.

Mr. Bandy: Yes, sir, that is right. It will be an act of courtesy on the part of the committee, and I think it would be a benefit to all.

President Hull: This is a matter that can scarcely be handled in so large a body as this, and the two plans presented are: One to have the smaller committee hear from the different people interested and then act, or that we act on the amendment and make the committee larger. Are there any further remarks on the amendment?

Mr. Thompson: Mr. President, as was remarked by the gentleman who made the motion, this paper contains a great deal of valuable suggestion, and this convention must consider the suggestions that are made in that paper, because each and every man who is here to-day knows that that paper meets with the approbation—I would say—of almost three-fourths of the Independent telephone managers of the nine states that are represented here. But it does occur to me that in order that a committee can act intelligently and have before it the conditions which confront the various managers of every state within its territory, that a man from each state should be delegated by the president and that this would be an aid to that committee. Now, after you have a committee, say of nine persons, that committee getting the aid and the assistance that they can, have power to call upon every member of this association, and any suggestions that might be made by the members of the association would be taken by that committee and fully considered. Then that committee, and the voice of that committee, could be given to a sub-committee, which that committee might appoint, and it seems to me it would represent the consensus of the intelligence of the nine states and probably would aid and assist that committee in arriving at an intelligent conclusion for the benefit of this association. Therefore, I urge and hope that the amendment offered by the gentleman and seconded by myself should be adopted.

President Hull: Are there any further remarks on the question of the amendment? (Cries of "Question.")

Secretary Coleman: Excuse me just a moment; it is not very becoming in one of the officers to discuss matters on the floor, but my observation teaches me that the larger you make committees, the less you get accomplished. In the first place, it is almost utterly impossible to get nine men together; one has an engagement here and another there, and one has an engagement somewhere else, and you cannot get them together. This has always retarded the work in every convention. Now the suggestion made by Mr. Bandy of Iowa looks to me like a very feasible solution of the contention, and that is that this committee of three be appointed and then let it announce immediately where it will meet, and let the representatives from every state go and confer with them, and place all the facts before it, because we know the small committee can get together. Let us get this matter in hand at once, so we can take action at the next session of this convention. Now that is my judgment; I may be wrong, but I think you will get the expression from every state just as well and at the same time you will most certainly get action, and get it quicker than you would by trying to corral nine different men from nine different states.

Mr. Bellamy: Mr. Chairman, I don't think I care to discuss the matter further, but it does seem to me, and I don't care to take issue with our friend, Mr. Coleman——

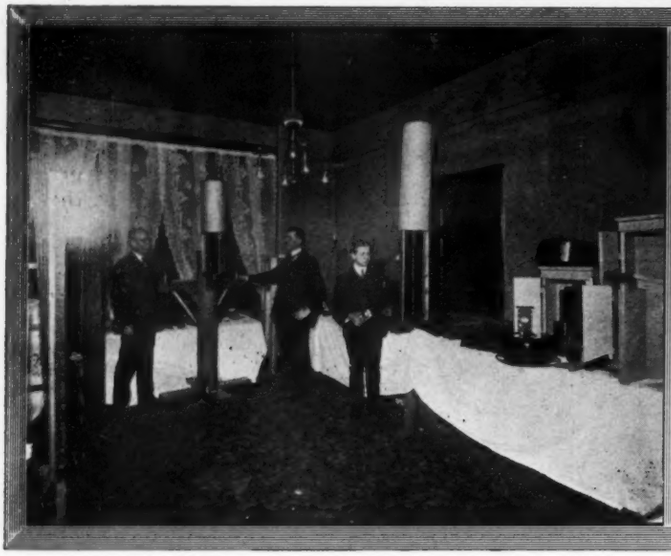
Secretary Coleman: It is only an opinion.

Mr. Bellamy: But I haven't any objection to taking issue with him if I don't agree with him. (Laughter.) Now it is the prevailing opinion generally that a large body of men, either large committees or large legislative bodies do very poor work. With that idea I want to take issue, and I think that any gentleman here who has read the history of his country to any advantage, if he will look at the Senate of the United States and the House of Representatives, he will come to the conclusion at once that the House of Representatives is a good deal nearer the people, and do about 1,450 times as much business as the Senate. Now I am not objecting to three men, but I do believe that every state that is interested in this association should be interested in getting up his new proposition. They should assume some of these responsibilities, and so far as the suggestion of my friend from Iowa goes, I doubt very much whether a man would go and say, "Here, I want to be heard," unless he was especially invited. We all have a little reluctance in poking our nose in where we don't happen to be wanted, unless we are really wanted, and it was on this theory that I offered this amendment.

Mr. Bandy: Mr. President, either our secretary or my friend and neighbor in Iowa misunderstood the intent of my remarks. I intended to indorse the committee of nine, and hoped that that committee would see to it that an invitation was extended to the members and visitors from other states to meet with it and give it (the committee) the information and advice which they might be able or willing to impart.

Mr. Bellamy: You mean the states in this association?

H. B. CAMP COMPANY. CENTRAL TELEPHONE & ELECTRIC COMPANY.



FRANK B. COOK.

EUREKA ELECTRIC COMPANY.

Mr. Bandy: I mean that there should be a committee of nine, and that that committee of nine should extend an invitation to the others to meet with it and help it in the matter. That is what I meant.

President Hull: Are there any further remarks? The question as I understand it is that the word "three" be stricken out of the original resolution and the word "nine" inserted. With that understanding there will be one from each state. As many as are in favor of the amendment will signify by saying aye.

The motion was carried.

President Hull: Now the question recurs on the original resolution as amended. Do you care to discuss it further?

The question being put, the motion was unanimously carried.

President Hull: I will appoint that committee in a few minutes. The next on the program is the report of the treasurer. I believe that the treasurer is not present as yet, and I will say, as the secretary has well said in his report, that if he were here it would be impossible at this time to make a definite report, for the reason that the manufacturers who have taken membership and the operating companies who are to take membership, have been slow about sending their amounts to the secretary, and for that reason the treasury will at this time show a deficit. We hope before the convention is over that enough members will pay their initiation, or their annual membership, to make this deficit a balance in the treasury. For this reason we will at this time, I think pass over the treasurer's report.

The selection of an executive board and the selection of the nominating committee, of necessity, will be held in abeyance. The next portion of the program invites the revision of the constitution and by-laws. It occurs to me, however, that we cannot take up this matter until we get the report of the committee which has just been appointed, for the reason if we are to change our constitution and by-laws we may change the manner of selecting our executive board, and the manner of selecting our nominating committee, and unless there is objection on the part of the members present, I will say that we will allow this part of the program to lapse until we obtain the report of the committee which is to act on the secretary's report. If there is no objection that will be the order.

Mr. W. Gilbert Thompson: Ought we not to have a committee to recommend officers? I would like to recommend the names of the officers of this convention to be appointed at this time. Ought that not to be done so that the convention could discuss the advisability of this plan? It seems to me that the revision of the by-laws and of the constitution would not interfere with that, and it occurs to me that at the beginning of the sessions that that committee ought to be appointed. I may be mistaken, but it seems it would be more wise at this time to have such a committee appointed for the purpose of considering during the interim who the future officers of the association should be.

President Hull: I will say to the gentleman who has just spoken that our present constitution is a peculiar one and was written and adopted for peculiar purposes (laughter) and under that constitution we have a peculiar method of selecting our officers. Now if we are to have a new constitution, which I think is entirely likely, it is possible, and I think entirely probable, that these officers will be selected in a different manner, and for that reason I made the statement that unless there was objection we would pass that over for the present. We will be here two days yet, and I think there will be many things brought out in the discussion which is to come that might well be said before this committee is appointed.

Mr. O. Rex (Indiana): I make a motion that the president be made a part of this committee of nine that was decided on a while ago, to act on the secretary's report.

The motion was seconded by Mr. J. S. Bellamy of Iowa.

President Hull: Do I understand that he is to be one of the nine or an addition to the nine?

Mr. Rex: An addition.

President Hull: That might cut my state out of its membership.

Mr. Rex: Well, as an ex-officio member of it.

President Hull: Well, if that is the wish of this body, that would be all right, but I should not like to be put on the committee to represent my state without some consultation with the members. If that is the motion, that the president be made ex-officio member of that committee, I will put the motion.

The motion was again seconded.

President Hull: As I understand, the motion is that the president of this association be made ex-officio member of this committee, which is to be selected to consider the secretary's report.

The question being put, the motion was unanimously carried.

Secretary Coleman: I want to make some announcements with explanations accompanying those announcements. Gentlemen, we have met here for business, and we cannot attend to business during the business hours of this convention in exhibit rooms. We give the exhibits half of our

time, that is, half of the daylight and all of the evening. That is quite fair, isn't it? And we think the exhibits ought to give us just half of the daylight. That is all we ask. (Applause.) There was an agreement entered into of this kind at our last convention, but it was not complied with, and now the officers of this convention, the executive board speaks through me in this matter, request that you please attend the meetings of this convention, the business sessions of this convention, promptly, be here on the hour, come here and sit down, and let us get to work, and when the business session ends then you can spend your time in the exhibit rooms or in the theaters or wherever you please. Let us do some business this week.

In the next place we have employed an official reporter, who is to give a verbatim report of this convention, and we will supply all the electrical and telephone periodicals with a verbatim copy of everything that transpires here, and we will have this ready to distribute to-night by 10 or 11 o'clock for this afternoon's session, and as promptly at all sessions thereafter.

By reason of a resolution at the last convention, your secretary had to publish several thousand copies in pamphlet form of Col. J. D. Powers' speech at this convention last year on the subject of "Independent Telephone Securities from a Banker's Standpoint." That speech so impressed the convention at that time that it immediately authorized the secretary to publish it in pamphlet form to be distributed at cost, or as near that as could be figured, after paying postage and expressage. We have distributed over 2,000 of these by express and mail, and we now have 2,000 more here for distribution. If you take anything under 500, you get them at five cents a copy; anything over that at three cents apiece, but we would like to dispose of them and they would be of great advantage to you in your particular locality.

Here we have an official program and catalogue of this convention, giving not only the exhibitors, but the number of their rooms, where they have their displays, as well as other information, and we have a sufficient number of them here to supply all of you, and we hope you will take them. We did not lay them around on the chairs because so much matter has been placed in the chairs that we thought they would be lost sight of and would not be looked at.

Secretary Coleman then called the attention of the delegates to the importance of having their railroad certificates stamped so as to obtain the benefit of the reduced fare and followed this with the announcement that the association would give a banquet in the large dining room of the Auditorium Hotel, on the ninth floor, on Thursday evening, December 10, at 8 o'clock, and extended a cordial invitation to the ladies to attend.

Mr. L. A. Frazee: I move that a committee of three be appointed by the chair to call upon the Illinois Telephone & Telegraph Company, commonly known as the Automatic, for the purpose of agreeing upon terms and conditions for connecting the toll lines in the territory of the Inter-State Association with its exchange now being installed in Chicago. Said committee to report back to this convention.

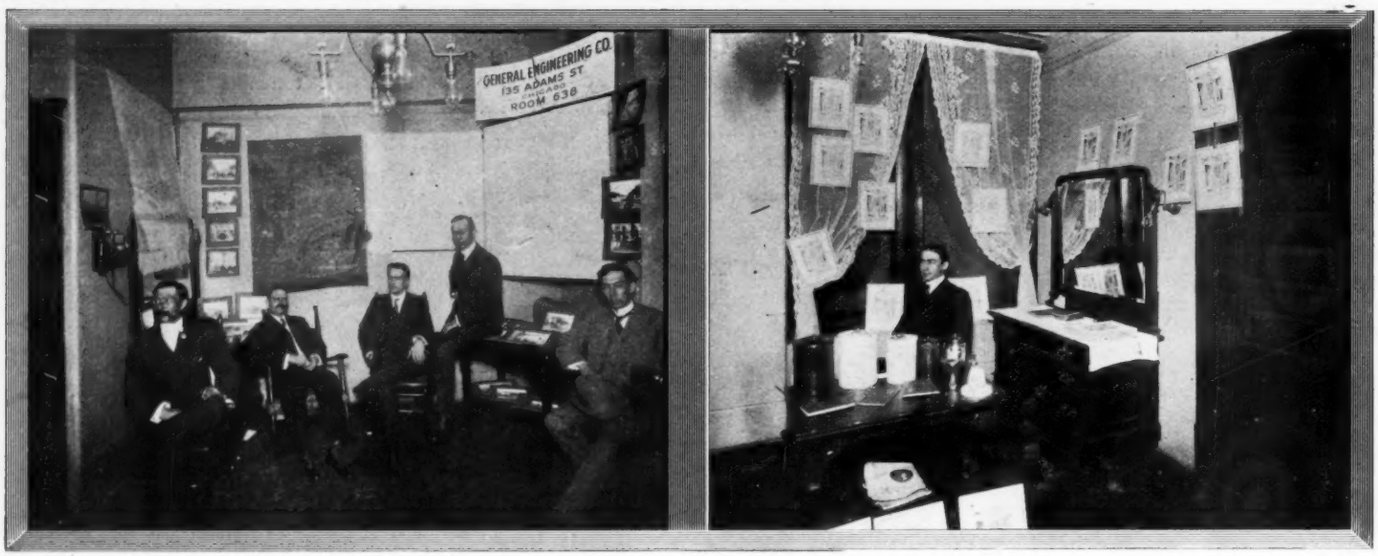
The motion was seconded by Mr. Swaney of Iowa.

President Hull: It has been moved and seconded that a committee of three be appointed by the chair to call upon the Illinois Telephone & Telegraph Company, commonly known as the Automatic, for the purpose of agreeing upon terms and conditions for connecting the toll lines in the territory of the Inter-State Association with its exchange now being installed in Chicago. Said committee to report back to this convention.

I am under the impression that something ought to be said about this in order that the matter might be fully understood. As I understand conditions at present, the Illinois Telephone & Telegraph Company has somewhere between 5,000 and 10,000 telephones installed, and in working order in the business portion, or within the loop in the city of Chicago. There are three and possibly four long distance toll lines that come at least to the borders of Cook County, and some within the borders of Cook County, that desire connection with this exchange or with some other Independent exchange in this city. I believe that there is already built into the city of Chicago and in operation an Independent telegraph line from the city of Milwaukee, which purposes also to become a part of the Independent telephone system of the cities contiguous to this territory. As I take it, the purpose of this motion is to wait upon the managers of this Independent telephone company of Chicago and ask them to see us.

Mr. Bellamy: It would seem to me that that should be largely the work of the Illinois association if you have one, and I understand you have. When I was in Chicago, four or five months ago. I met someone here who told me that there was an Independent telephone company that operated in the south part of the city, if I am not mistaken, that had some arrangement by which it expected to get into the city here, and of course us fellows who live out in the suburbs of Illinois would like to get to Chicago, but we expect Chi-

FULMER-KUESTER-SCHROEDER COMPANY. F. B. BADT & COMPANY.



GENERAL ENGINEERING COMPANY.

GORDON BATTERY COMPANY.

cago to take care of us, and it seems to me this proposition should be more particularly under the control of the Illinois people.

Mr. Hackney (Wisconsin): I am not a member of your association, but am considerably interested in this point. I have been associating with Brother Coleman for the last two weeks, and I have quite a cold (laughter), but I operate and own an exchange that is close to the boundary line of Illinois. I am operating in Wisconsin, and we are very desirous to get connection with Chicago. Now, if we can, by a committee, or in any other way get an expression, I feel that this association, as being an inter-state association, should be the one to get it, and I feel that it would benefit the whole section, not alone Illinois, but of all sections of the country.

Mr. Barnhart (Indiana): Mr. President, I come from Indiana, and I say to you, gentlemen, that all northern Indiana, and particularly Indianapolis, is more anxious to get into Chicago with their toll lines than they are to get anywhere else, and for one I would like to know before I go home whether this new telephone company in Chicago purposes to accept our business and to give us these connections. It can give us some assurance of some kind. I have been informed that men who have approached that company have had no satisfaction whatever, and I would like to know before leaving this convention what their intention is, and I am heartily in favor of appointing a committee of three and letting it confer with the officers of that company, because it will have ample time to do it in the three days we are here. The company can give the committee some sort of an answer.

President Hull: Are there any further remarks? I want to say to my friend, Mr. Bellamy, that the Illinois association has not had a meeting for some time, or if it has I have not been notified. And further, that I consider this not a question of Illinois, but a question of the nine states that belong to this association. I want to say further about this resolution as it is a little vague on one point, that upon consultation with the mover of it, I find that his motive is to have this committee wait upon the manager of the Illinois Telephone & Telegraph Company and ascertain the facts. That is to say, just the work it is doing in Chicago and its intentions as to the members of this association. Are there any further remarks?

(Cries of "Question.")

President Hull: As many as are in favor of the appointment of this committee will signify the same by saying aye.

Motion unanimously carried.

Secretary Coleman: The secretary is authorized to make another announcement. There has been one concern from the South that has secured by correspondence membership in this association that is not entitled to membership by any sort of means or from any sort of consideration, and if he will call on the secretary he will certainly get his $5 returned to him quickly. We will be very much obliged to the gentleman if he will do this without anything further being said.

One other announcement I wish to make. It was decided by the executive board in our conferences here in June and September that we would have a question box in connection with this convention. We have not the box here, but suppose the president and secretary can act as interrogation points, and you can file your queries with us, and they will be read at each session of the convention.

President Hull: I was just going to make the same announcement, except I wanted to call the attention of this convention to the fact that it was decided at our last annual meeting that we have this question box, and it was further approved by the executive board at its meeting in September. Now I think some provision should be made for this, and if there are any questions they should be left on the table here, so they may be answered to-morrow, and by that time we will try and have a box where they can be sneaked in if you do not want to come up openly and hand in your questions.

Mr. Cheedle (Illinois): I wish to say I am heartily in accord with the spirit that has confirmed the adoption of the resolution that was just passed a few minutes ago. A thought has occurred to me, however, that it would be well to supplement that resolution with an invitation from this convention, through this committee, to Mr. Wheeler, the president of that company, to come before this convention and favor us with a detailed statement to some extent as to what his company has done in Chicago; what its plans and purposes are as to taking care of Independent telephone interests, and giving us any further and other information that we may ask or that he may see fit to impart; and I move you, Mr. Chairman, that this committee be directed to extend to Mr. Wheeler an invitation to address this convention at such time as it may be found convenient for himself and for the convention.

Mr. H. S. Herr: This is a good suggestion, and I think it is something we ought to heartily support, and therefore I will second it.

President Hull: It has been moved and seconded that this committee, which is appointed to wait upon the Illinois Telephone & Telegraph Company, ask Mr. Wheeler to come before this convention at his own convenience at one of our

sessions, within the next two days, and address us. Are there any remarks?

The question being put, the motion was unanimously carried.

President Hull: Those of you who were here at our meeting last December will no doubt remember that we received at that time an invitation to hold our next meeting in St. Louis. This invitation came from the Louisiana Purchase Exposition. Under our present constitution we cannot meet during the time the Louisiana Purchase Exposition is open. It was suggested at our last meeting that an amendment be made to our constitution so that if we so desired we could meet during the sessions of the exposition, or during the time it was open. Now we have with us to-day Professor W. E. Goldsboro of the Department of Electricity of the Louisiana Purchase Exposition, who comes to repeat the invitation, and we will now hear from him.

Prof. Goldsboro: Mr. President and Gentlemen: I had the pleasure last year of meeting with and extending to you a very cordial invitation at the request of our president and officers to meet in St. Louis next year and hold your annual convention there. As I remember the occasion of the convention, you were good enough then to take the matter under consideration with a good prospect of your acting, and I hope this year that you will decide to come. There will be many other electrical conventions held there, and I now take pleasure in handing your president an invitation on behalf of the exposition officials and I trust that you will accept it. (Applause.)

President Hull then read the following letter:

OFFICE OF THE PRESIDENT.
Saint Louis, December 7, 1903.

To the President of the Inter-State Independent Telephone Association: Sir—On behalf of the Louisiana Purchase Exposition, I desire to extend to the Inter-State Independent Telephone Association a cordial invitation to hold the annual meeting of the association for 1904 in the city of Saint Louis.

In that year will be held at Saint Louis the Universal Exposition in commemoration of the one hundredth anniversary of the purchase of Louisiana territory. The Exposition management will be prepared to furnish, without charge, a satisfactory hall for the holding of the sessions of the association. The committee on ceremonies will, if desired, recognize the presence of the Inter-State Independent Telephone Association by setting apart a special day, or by providing some distinctive feature of the program.

The information service, conducted without charge by the Exposition management, will assist delegates in obtaining satisfactory accommodations at reasonable prices. The fair name of Saint Louis for hospitality will not be marred in 1904. Assurances given by the railroads warrant the promise of very low rates in transportation. Respectfully, D. R. FRANCIS, *President.*

President Hull: The invitation will be referred to whatever committee is appointed on time and place. I presume no action is desired at this time, but the matter will be taken up in due course.

Mr. Bastin of Kentucky then announced that he thought the Inter-State Independent Telephone Association should have an emblem to be used upon its stationery. The same emblem to be used to form a button or badge. He presented the following motion:

First, that a committee of three be appointed to select an emblem.

Second, that they be authorized to receive designs and to pay $100 for the design.

Third, that the design be copyrighted.

Fourth, that a charge of fifty cents be charged to Independent companies desiring to use this emblem.

Mr. Barnhart: The secretary's report suggested something of that kind, and if there is to be a committee appointed to consider the secretary's report, this motion could be taken up by the committee already named.

Mr. Thompson: With reference to this matter, it occurs to me that the Inter-State Independent Telephone Association should adopt an emblem that might be used by Independent telephone companies. I desire to say, however, that in Ohio there has been an emblem adopted that is the official emblem of the Independent telephone companies of that state and over half of the Independent telephone companies of that state now use that emblem, and I do not know that after the adoption and purchasing of the signs they would care now to change.

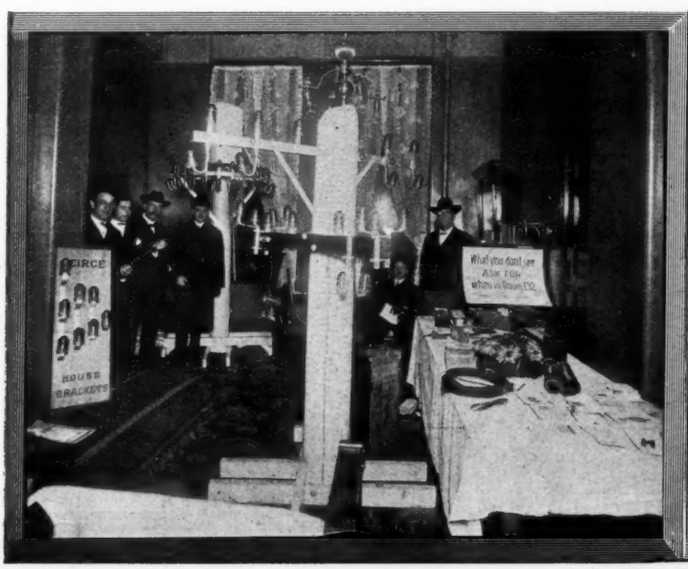
Mr. Bastin: I do not want to antagonize the people from Ohio, but we have no emblem in the National Association, and I think we need it. It would be a nice thing to have such a badge, to show that we belong to the fraternity of Independent telephone operators.

President Hull: I believe there is no second to the motion. As I understand the motion it is that a committee of three be appointed to select an emblem; that the committee be authorized to receive designs and to pay $100 for such design; that the design be copyrighted, and that a charge of fifty cents be made to Independent companies desiring to use it.

Mr. Barnhart: I believe the motion and resolution should properly go to the committee of nine that is to be appointed. In that committee we will have representatives from every state.

President Hull: Do you make such a motion?

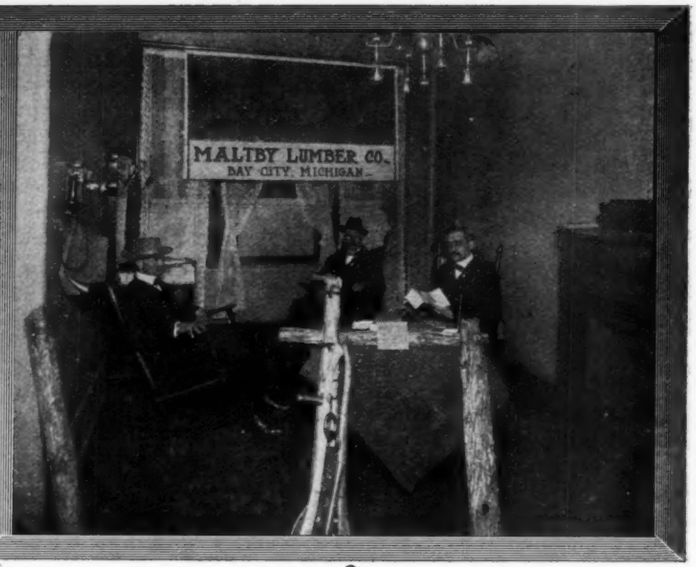
Mr. Barnhart: I will make that as a motion.



ILLINOIS ELECTRIC COMPANY.

INDIANA STEEL & WIRE COMPANY.

KESTER ELECTRIC MANUFACTURING COMPANY.



MALTBY LUMBER COMPANY.

The motion was seconded.

President Hull: It has been moved and seconded that this matter be referred to the committee of nine who are to act on the secretary's report. What is your pleasure?

The motion was carried.

President Hull: I want to announce to the members present that ladies are not only welcome, but invited to attend our sessions. The announcement was made by the secretary a while ago that the ladies were expected at the banquet. I also want to announce that the ladies are expected at our business sessions, and that we will be glad to have them here.

Secretary Coleman: Another announcement, if you please: I am glad to announce it, too, that a manufacturer was the first man to take a bunch of tickets to the banquet. He bought 100 tickets. (Applause.) But he doesn't live, nor his business is not in Chicago. (Applause.) Now all of the men who clapped hands should not imagine that that one manufacturer is going to give you his tickets; they are all for the ladies. (Laughter and applause.)

President Hull then announced that the Illinois Telephone & Telegraph Company had extended an invitation to the delegates to inspect the operation of its telephones, and to visit its "girlless" switchboard; the company having arranged to allow the members to make an inspection of the system during the hours of 9 until 12 o'clock on the following morning.

President Hull: I will now appoint as the committee to visit officially the management of the Illinois Telephone & Telegraph Company the following: Mr. L. A. Frazee of Indiana, Mr. Brady of Iowa, and Mr. W. Gilbert Thompson.

As the committee of nine—the big nine—I will appoint the following: Henry A. Barnhart, Indiana; A. G. Hawley, Iowa; W. Guy Jones, Ohio; C. B. Cheadle, Illinois; P. H. Moulton, Minnesota; W. Mathews, Kentucky; C. E. Marsh, Michigan; J. M. Kennedy, Kirksville, Mo., and W. F. Goodrich, Wisconsin.

Mr. Barnhart, as chairman of this committee, I will ask you to state the time and place when the committee shall meet?

Mr. Barnhart: Mr. President, if agreeable to the members of that committee, I would like to have them meet at my room, to-morrow morning at 8 o'clock. If there is any objection to that hour or that place of meeting I would like to know it now, and if not I would like to have every man there at 8 o'clock.

Mr. Cheadle: As a member of that committee, speaking for myself only, I wish to say it is impossible for me to be present. I live down at Joliet, and I have engagements that will make it almost impossible for me to be at the meeting at that time. I will try to attend at 9 o'clock.

Mr. Barnhart: Very well, you may announce it at 9 o'clock; I would prefer 8 o'clock myself.

President Hull: Permit me to suggest this: let the hour remain at 8 o'clock, and perhaps quite a little of the preliminary skirmish may be cleared up, and when Mr. Cheadle arrives the main questions will be in shape to be considered. Would that be satisfactory to you, Mr. Cheadle?

Mr. Cheadle: Yes, sir, I will get here as soon as I possibly can.

Mr. Barnhart: Mr. President, then I will fix the hour at 8 o'clock, and as many as can come are required to be there. I want everybody there that can possibly get there at 8 o'clock.

President Hull: I want at this time to call the convention's attention to the importance of the program for to-morrow afternoon. We will start at 2 o'clock. I hope that everybody will be here promptly at 2 o'clock in the afternoon, as we are going to have a good deal of discussion that we want you to hear.

Secretary Coleman: Since there is to be no business meeting to-morrow morning, I want the committee on resolutions to meet at room 450 in this building, at 10 o'clock to-morrow instead of 8.

On motion the convention then adjourned until Wednesday, December 9, at 2 o'clock p. m.

SECOND SESSION—WEDNESDAY, DECEMBER 9, 1903.

The convention was called to order shortly after 2 o'clock by President Hull, who called upon the committee appointed to prepare resolutions relative to the death of Ex-President Raney for its report. Secretary Coleman, as chairman of the committee, then reported as follows:

Secretary Coleman: As chairman of that committee, the secretary was kept engaged on the general committee of nine to which the secretary's report was referred, and so we were unable to have a meeting of this committee and we ask for more time, until to-morrow, and that Mr. Stanley S. Lichty be added to that committee.

President Hull: Very well, it will be so ordered. Allow me to inquire whether there was any provision made for a question box?

Secretary Coleman: Nothing other than that questions will be received by the secretary.

President Hull: As I understand the order of business, following each paper there will be a general discussion upon that paper. If there are those who do not desire to enter

into the discussion, but who desire to ask questions relative to the subject under discussion, or any other subject which may be of interest to the convention, we will be glad to have you hand the questions to the secretary.

Pending the arrival of the gentlemen who were to read papers to the convention, President Hull called upon Mr. Thompson of Ohio to make the report of the committee which had been appointed to visit the Illinois Telegraph & Telephone Company.

Mr. Thompson: I suggest that our report be deferred until the chairman of the committee arrives, or if you wish, I can proceed.

President Hull: We suggest that you proceed.

Mr. Thompson: We visited Mr. Wheeler this morning and inquired of him the attitude of the automatic company towards the Independent telephone companies, and especially with reference to his company's position as to long distance connections. Mr. Wheeler said to us that his company was at present operating a switchboard in Chicago with about 4,000 subscribers; that it expected within the next thirty days to have 10,000 of the business men of Chicago connected with the automatic service. That the company is very busy, and that it had given no attention up to the present time to the long distance feature. The company wanted it distinctly understood that it was Independent in the telephone field, perhaps more independent than any of the Independent telephone companies, and that early in the spring it expected to complete the cable to the south side of the city, the west side or south side, I forgot which——

President Hull: The west side. It is operating the south side now.

Mr. Thompson: The west side. And proposed to take up the question of making long distance connections. Mr. Wheeler assured us as a committee that as soon as it was practicable to do so, his company would make long distance connection with any company proposing it, that would furnish good service with metallic lines, but until spring it would not be in a position to do it, and for that reason the matter would be deferred until that time. He said it would be as advantageous to his company to have long distance connections as it would be to the Independent companies.

The committee then suggested to Mr. Wheeler that he have a representative come to this convention hall either this afternoon or to-morrow and state precisely the position that his company expected to maintain towards the Independent companies within this association district, and he said that he would see to it that a representative would be here and address this association upon that question to-morrow. I believe that is all.

President Hull: Gentlemen, you have heard the report of this committee. Is it your desire to take any action?

Mr. Thompson: Mr. President, I think further than the receiving of the report, action should be deferred until the representative referred to has addressed us.

President Hull: Very well, if that is the wish of the convention, and I presume it is. It is so ordered.

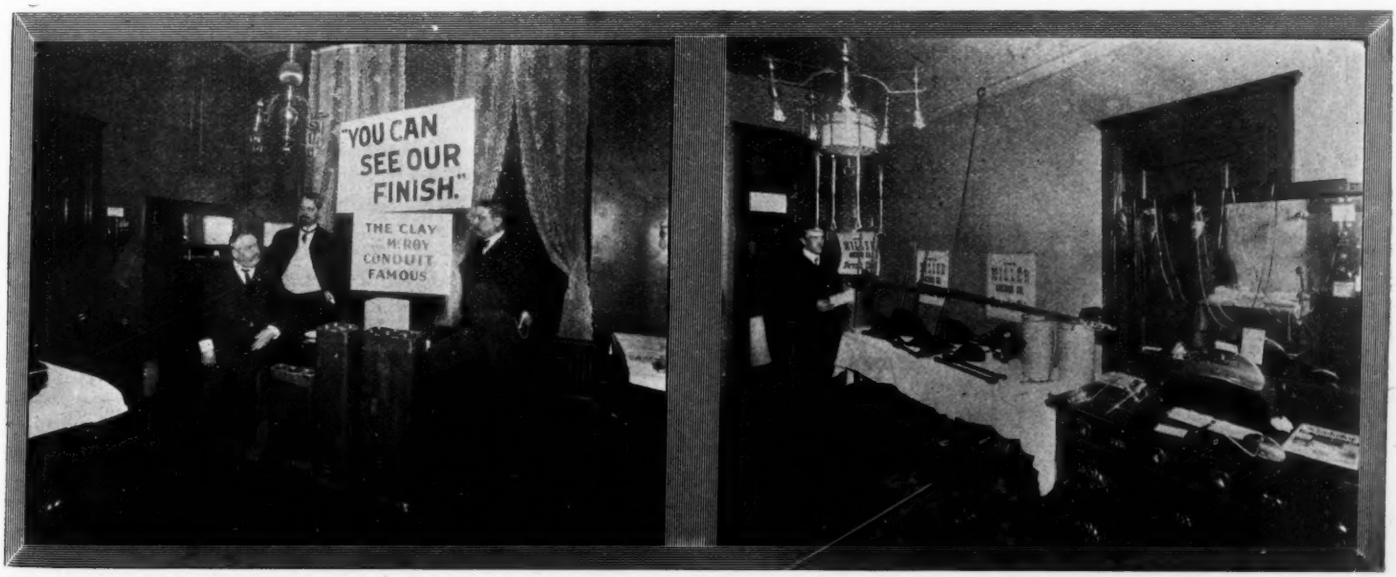
We have just a few moments now, and we would be glad to hear from Mr. Wasson. Mr. Wasson has undertaken the collection of telephone relics for exhibition at the Louisiana Purchase Exposition, and we would be glad to have him tell us something about his work.

Mr. Wasson: The story is a short one. We have a collection of what you might term the evolution of the Independent telephone, and we applied to the president of the Louisiana Purchase Exposition for a little more space where we could make this exhibition at the World's Fair. We only called for sixty square feet, and that would be all that is necessary for what we would have. A great many of the telephone people found out what we were going to do, and they came to us and said, "Here, we have got this, that and the other thing, which would be of interest, and we have received so many different relics, as you might term them, that we found it necessary to apply for increased space. We now have 1,000 square feet at our disposal. We have taken up this work expecting to carry it through at our own expense, and while the business has nothing in it so far as money is concerned, we felt that it would be an interesting exhibit and so we want to ask your co-operation. If any one has anything that they think will be of interest we wish that it might be sent to us. We are willing to pay the express charges and will see that the article is exhibited. We have a record showing receipts of all intended exhibits. A record of all correspondence is also kept so that any one who wishes to have articles returned can do so, and we will pay the expense of the return charges.

President Hull: Are there any questions in regard to this matter, or will someone make a motion that we endorse this work and give it our moral support? I will be glad to hear from the convention.

Mr. Thompson: I move that this association endorse the work the genetlemen are now proceeding with, and that the various members of the association be urged to do all they can to assist them.

The motion was seconded, and the question being put, was unanimously carried.



M'ROY CLAY WORKS.

MILLER ANCHOR COMPANY.

MONARCH TELEPHONE MANUFACTURING COMPANY.

NATIONAL CARBON COMPANY.

President Hull: Mr. Gary has a few ideas to present to the convention, and he will now be given an opportunity. It gives me great pleasure to introduce to you Hon. Theodore Gary of Macon, Missouri.

Mr. Gary (Missouri): I was just talking a little while ago and it was suggested that I give my views to the convention about the classification of freight rates, and also to the treatment of railroads towards the smaller exchanges along the line. I am using some dry battery instruments, and I find that the freight rates are based on the same classification as the old wet battery was. It costs about 4 cents apiece to get them into the western part of Missouri from Cleveland, and about 3 cents apiece from this district, and it occurred to me that we ought to do something in the line of getting a proper classification on dry batteries.

Now we all know that the old glass jar would not stand very much damage, and the breakage and liability for damages was very great compared to the dry battery, and there ought to be certainly a different classification on dry batteries. Then in the matter of returning reels. If we were farmers shipping a crate of poultry from somewhere out west to New York, we could get the empty crate returned, in some instances without any charge at all, and in others at about ¼ of a fourth-class rate. When you come to return these empty reels, you are charged perhaps double first-class rate, or at least a very high rate. Some of the roads classify them higher than the original shipment. It seems to me that this sought to be looked into. This is all handled by a department that looks into the rates and classifications of the different roads, and it should be handled by a proper committee. And still another matter. It is in connection with the railroads' attitude towards the small exchange operator along their different stations. I don't know what your experience has been, but in Missouri the railroads have lately demanded, in most cases, that the exchange furnish free service, and if they did not agree to that they were required to take their telephones out. Well, of course, our subscribers need this service, and while they recognize this, at the same time it seems to me the railroad company needs that service also, as it has become a fixture and a part of the equipment that a station needs. Now it does seem to me that this association, through a proper committee, might adjust this matter so that the small exchange operator would get a fair show. I would like to hear from some of those present who have had similar experience.

Mr. Holdole (Iowa): I might call the gentleman's attention to the fact that we are paying about four or five times the freight rate on telephone instruments that we are paying on sewing machines. I don't remember the classification of sewing machines, but telephone instruments call for a different classification, and I know in Iowa it is about five times the rate paid on sewing machines. Perhaps that might be considered along with the classification of freight.

President Hull: It seems to me this is a matter of a great deal of importance to those who are shipping, and I would be glad to hear from any others who have any remarks on this subject. Is it your desire that a committee be appointed to look into this matter?

Mr. Meyer (Kentucky): I move the appointment of a committee of three to have charge of the matter of investigating and taking all suitable and necessary action for the proper adjustment of these rates, the committee to have full power to do anything, to represent this convention, and to bring to bear whatever wish this convention may have in this matter. The committee ought to have full power for final action. I suppose it will report, without being instructed, to the next convention, and we will probably hear from it long before that time.

President Hull: Do I hear a second to the motion made by Mr. Meyer that a committee be appointed?

Mr. Meyer: I wish to amend that motion to include Mr. Gary as chairman.

Motion seconded.

President Hull: It has been moved and seconded that a committee of three shall be appointed, of which Mr. Theodore Gary shall be chairman, whose duty it shall be to take up the situation with the transportation companies, both as to the installation of telephones and as to freight rates. I believe that covers the motion. Are there any further remarks?

Mr. Gary: It seems to me that is getting too much on one committee. The freight classification comes entirely before one body, and the express business comes before another body of men, and I believe the freight classification ought to be divided up at least into three committees. The express business comes entirely before a different set of men, and I apprehend there will be a good deal of work to do in every one of these branches if anything is to be accomplished We ought to have at least three committees on that if you are going to include the express companies.

President Hull: I will entertain an amendment of that kind if you want to make it.

Mr. Gary: I offer as an amendment that there be three committees of three each; one to take up the question of freight classifications; another to look after the question of

getting telephone service installed and paid for, and another to take up the question with the express companies.

President Hull: Do I hear a second?

Mr. Thompson: I second the amendment, or rather the substitute motion.

President Hull: It has been offered as a substitute for the other motion, that three committees of three each be appointed for the purpose stated. Are there any further remarks?

The question being put, the motion as amended was unanimously carried.

Secretary Coleman: While the president is selecting the committees I want to make some announcements. Is there a gentleman in this hall by the name of Sims of Nashville, Tennessee?

Mr. Sims: Yes, sir.

Secretary Coleman: Mr. Sims, I would like to see you at the desk.

(Mr. Sims then came to the platform.)

Secretary Coleman: Mr. Sims, I am authorized to return to you the five dollars by which you secured membership in this association. You are not entitled to membership.

Mr. Sims: Why not?

Secretary Coleman: On the ground that you are connected with the Cumberland company.

Mr. Sims: Well, I must decline it.

Secretary Coleman: I guess it is proper that I explain. This gentleman wrote to me, as secretary of the Inter-State Association, saying that he represented the Southern Electrical Company of Nashville, which is presumed to be a supply house, and he sought membership in the Inter-State Association. I wrote and asked him if he had any connection with the Cumberland Telephone Company and if so he was not entitled to membership, but it not, he would be entitled to the privileges of this convention and I heard nothing more. He is here, and I am credibly informed that he is an associate of the Cumberland Telephone Company, which is a licensee of the Bell, and I simply offered in a polite way to return this money, as I do not consider he is entitled to membership. (Great applause.)

Mr. Sims: Am I not to be heard at all, sir?

Secretary Coleman: I think not; I do not think you are entitled to be heard on this floor.

Mr. Sims: Am I not entitled to correct the secretary if he is mistaken in a statement that he has made?

A Member: I think it is no more than right.

President Hull: Yes, we will hear you on that matter.

Mr. Sims: I am connected with The Southern Electrical Company, which is not owned by the Cumberland. I wrote to Mr. Coleman and he wrote me a very courteous letter inviting me to join the association, which I accepted, and he said nothing in that correspondence as to whether I was in any way connected with the Cumberland Telephone Company or any other company. I have his letter here and the letter speaks for itself. And then at his suggestion I sent in the initiation fee and received a certificate of membership, which I have in my pocket, and if any manufacturer or handler of telephone supplies is entitled to be represented here I think I have that right. So far as Mr. Coleman asking me whether I was in any way associated with the Cumberland company, he did not do so.

President Hull: Are you in any way connected with the Cumberland Telephone Company?

Mr. Sims: I am, sir. I am one of the stockholders.

Mr. Tetu: I would like to ask Mr. Sims if he is not the purchasing agent of the Cumberland Telephone Company?

Mr. Sims: I am, sir, and if there is any man buys more——

Mr. Tetu: Are not Hume, Caldwell and Webb members of the Southern Electrical Company?

Mr. Sims: They have been, but are not now. The Southern Electrical Company has been entirely disconnected with the Cumberland.

Mr. Tetu: Gentlemen, I am on record here as protesting against the admittance of anyone not entirely affiliated with the Independent movement, and the question resolves itself to this: Either Mr. Sims leaves the floor or I do not remain. (Prolonged applause.)

Secretary Coleman: Gentlemen, I move that his membership be revoked.

Mr. Tetu: I second the motion.

President Hull: It has been moved and seconded that the membership of Mr. Sims, representing the Southern Electrical Company be revoked. Are there any remarks?

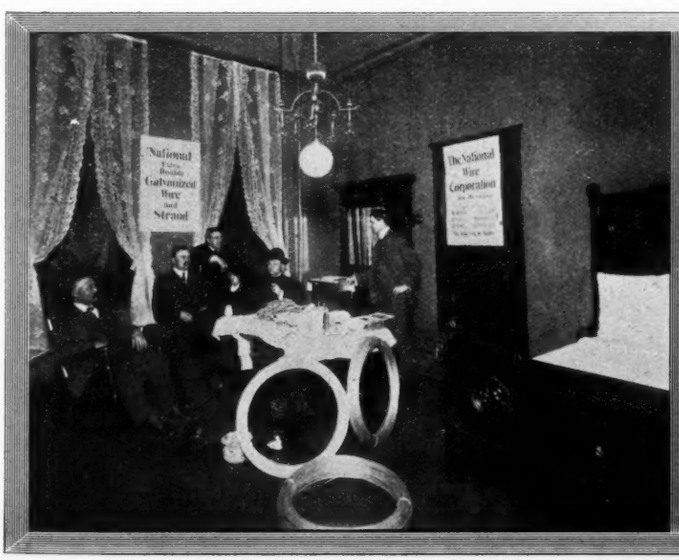
(Cries of "Question.")

The question being put, the motion was unanimously carried.

President Hull: We will now have the report of the "Big Nine" committee.

Mr. Henry A. Barnhart, chairman of the committee of nine, appointed to act on the secretary's report, then read the committee's report as follows:

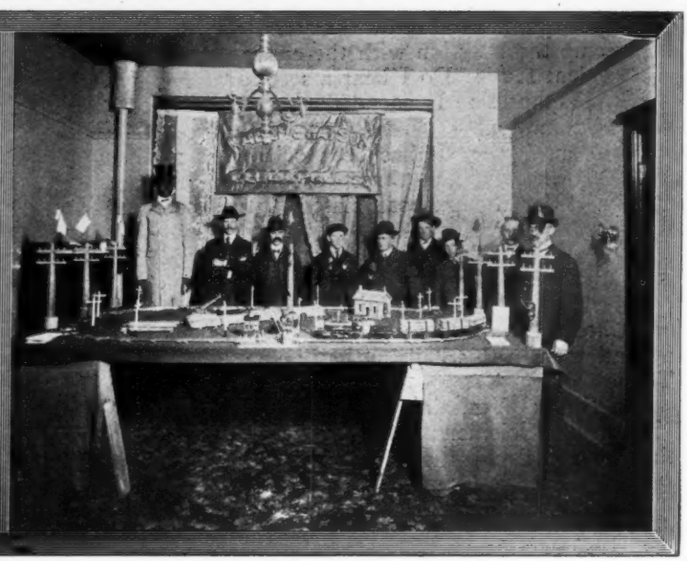
To the chairman and members of the Interstate Telephone Association, in convention assembled: Your committee appointed yesterday for the purpose of acting on the suggestions and recommendations contained in the secretarys annual report and consisting of one member from each state in the association, comprising nine states, beg leave to report as follows:



NATIONAL WIRE CORPORATION.

NEW HAVEN NOVELTY MACHINE COMPANY.

NORTH ELECTRIC COMPANY.



RABER & WATSON.

That this committee was in continual session from 8 a. m. until 12:30 p. m., with all representatives present, with the exception of the ones from Ohio and Missouri, and they were further aided in their work by a number of others either invited or voluntary callers, according to instructions given the committee. By reason of objectionable clauses given in our present constitution and by-laws they were considered inadequate for our present use. It was the unanimous sense of the meeting that action be not delayed, on the adoption of a new constitution and by-laws or on other important matters contained in the secretary's report. To this end the following resolution was adopted:

Resolved, That the life of this convention being too short in which to prepare permanent constitution and by-laws, the chairman is authorized to appoint at once a sub-committee, consisting of President Hull, Mr. Moulton, Mr. Cheadle and Mr. Goodrich to prepare a suitable constitution and by-laws under which the association is to continue until permanent organization is effected. The chairman appointed such committee to report back to the larger committee.

The temporary constitution and by-laws will in due time be presented to the association for your adoption.

The committee presents the following recommendations:

First, That this association be incorporated without capital, profits or liability.

Second, It shall be an organization covering the present states in the association, together with such other states or territory as it may be deemed of interest to the members of this corporation.

Third The membership fee for any operating exchange company, toll line company, individual or corporation, to be fixed at $5.00 per year, with an additional tax if necessary, not to exceed ..... cents per toll line mile, or ..... cents per telephone, of exchange.

Fourth, Uniform contracts for toll line connections, and as far as possible, uniform rates in exchanges based on telephones in operation. In connection to have a schedule showing cost of operation and rates to be charged.

Your committee further begs to present the following resolution for your adoption:

Resolved, That a permanent committee consisting of Mr. Hull, Mr. Rex, Mr. Coleman and Mr. Barnhart be appointed by the president, with himself as chairman of the same, to carry out the recommendations of this committee, and to effect the organization of this association.

Respectfully submitted,

HENRY A. BARNHART, *Chairman.*
W. F. GOODRICH, *Secretary.*

Mr. Meyer: I move the adoption of this report.

Motion seconded.

President Hull: It has been moved and seconded that the report of this committee be adopted. Are there any remarks?

The question being put, the motion was unanimously carried, and the report adopted.

Mr. Tetu: I would like to know if there has been a canvass made of the delegates with a view to ascertaining whether or not they were strictly Independent men. I ask for my own information. I have reason to believe that there are other men here under the guise of Independent men who are not strictly Independent men.

President Hull: I will say, Mr. Tetu, that there has not been a canvass made. Last year we passed a resolution which excluded men who were Bell men from our meeting, and it was thought there would not be any necessity for further action.

Mr. Tetu: Mr. President, you don't understand the Bell men as well as I do. And I think perhaps they might be here. I don't know whether they are here, but I move you that a committee be appointed to canvass the delegates here this afternoon and to admit no one unless he is properly vouched for. I made the same motion last year, because I saw there were such men here, and I have been driven to such a position to-day because I saw there were Bell men on the floor.

President Hull: It has been moved and seconded that a committee on credentials be appointed whose duty it shall be to see that none are admitted to our proceedings except those who are in truth Independent operators.

Mr. Splane (Pennsylvania): Mr. Chairman, I also wish to add to the remarks of the gentleman from Louisville that I saw a man that I knew to be a direct representative of the Bell people, and he is also a member of this association, from what I learn.

President Hull: Who was he, Mr. Splane?

Mr. Splane: I was informed that he was not an Independent in spirit.

President Hull: I take it, gentlemen, the purpose of this motion is not to exclude people who are Independent telephone operators in the hall, who do not, however, as yet belong to this association.

Mr. Splane: The gentleman I refer to is from Pittsburg, Pennsylvania. He had an article in the Pittsburg papers announcing the meeting of this association in Chicago and giving a little synopsis of it, and went on and said that Pittsburg would be represented by this party in question. I have no hesitation in saying who the gentleman is. He is known as Fred Deland. Whether that is his right name or not I do not know. (Applause.) If Mr. Deland is a member of this association I cannot say.

President Hull: Is Mr. Deland in the room?

A Member: He was in the corridors this morning.

President Hull: Does anyone know if he is here?

(No response.)

President Hull: If he is a member of the association I do not know it.

Mr. Wasson: It seems to me that whenever we meet as

Independent telephone people, there is always a colored gentlemen in the woodpile. (Laughter.) Now this is a pretty representative body of men, but we are not doing business on business principles. It is very seldom that we have conventions without a committee on credentials. In our state association at Cleveland we get a dozen Bell men who even had nerve enough to go to the banquet and eat at the table and break bread with us, and went out with their axes the next day. Gentlemen, I move that a committee on credentials be appointed.

President Hull: That motion has already been made. If you will bear with me just a moment. I have been letting this discussion run rather free—I will finish the subject before us. As I understand it the motion was put and carried that a committee on credentials be appointed.

A Member: It was not put.

President Hull: I had just started to put the question when someone interrupted me. Are there any remarks on the question?

Secretary Coleman: Mr. Fred Deland has no membership under his own name. He may, however, have gotten in under the name of some company.

Mr. Splane: Is the Federal Telephone Company of Pennsylvania a member?

Secretary Coleman: I can tell you in a moment.

President Hull: That is not a Bell company. I am quite sure it is not.

Mr. Splane: The Federal Telephone Company of Pennsylvania is a stool pigeon of the Bell Telephone Company organized to fight the Independent system throughout western Pennsylvania.

President Hull: I am quite sure it has no membership.

Mr. Tetu: Mr. Schlosser of Gibson City, Illinois, I undrestand, represents a company that is a sub-licensee of the Central Union Telephone Company. Under the ruling of last year, no sub-licensee of the Bell company or any of its licensees are entitled to recognition on the floor of this convention.

Mr. Schlosser (Illinois): I represent a company in Gibson City, which was organized the second of this month. It has no contract of any kind with the Bell people. It connects with the Bell exactly as Mr. Wasson's company connects with it. Mr. Wasson's company is just as guilty as our company is in that respect. So far as the attendance upon the convention is concerned, that is a matter at the pleasure of the convention. As far as the proceedings are concerned, I take all the convention reports and expect to read the proceedings clear through. I have already asked this convention for a definition of a Bell licensee company.

President Hull: Do you give your long distance business exclusively to the Bell?

Mr. Schlosser: We have no long distance lines except the Bell in our territory.

President Hull: You use the Bell connection?

Mr. Schlosser: What other line could we use? Give us something else to use. That is the fault of you, gentlemen. What shall we use? Use nothing? The Bell people pay us in the neighborhood of $150 a month as our per cent of the business. Now, gentlemen, in that position what would you do? Would you cut off that connection and lose the income? The gentleman from Kentucky said last year, "I am Independent to the core," but he added, "you certainly would not expect me to throw aside my Bell connection when I have nothing else to accept?"

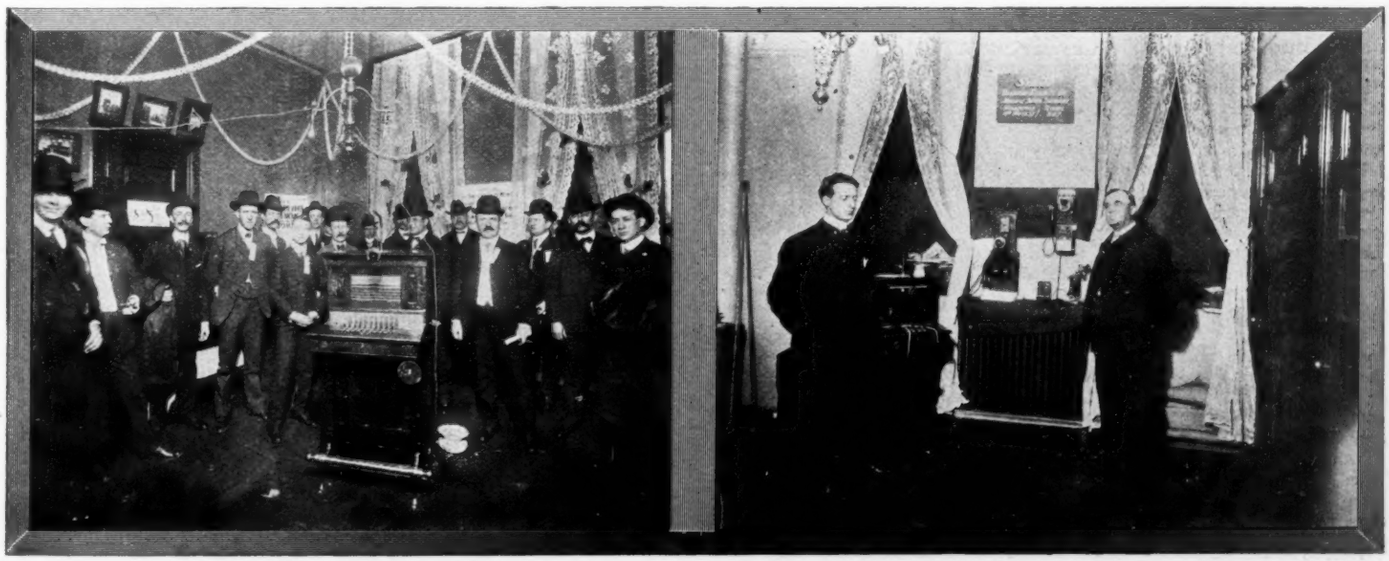
President Hull: Are you in a position if Independent lines reach you to drop the Bell?

Mr. Schlosser: Well, when any Independent line comes through there, if it offers us as good a proposition as the Bell, we certainly will accept it. (Laughter and cries of "Oh, well.")

Secretary Coleman: I want to explain that this gentleman wrote to me before the last convention, explaining the situation he was in, and asking that it be taken up in the convention and a committee be appointed for the purpose of deciding about just such conditions, and I think it is due to him to make this explanation. It was discussed last year, but no action was taken.

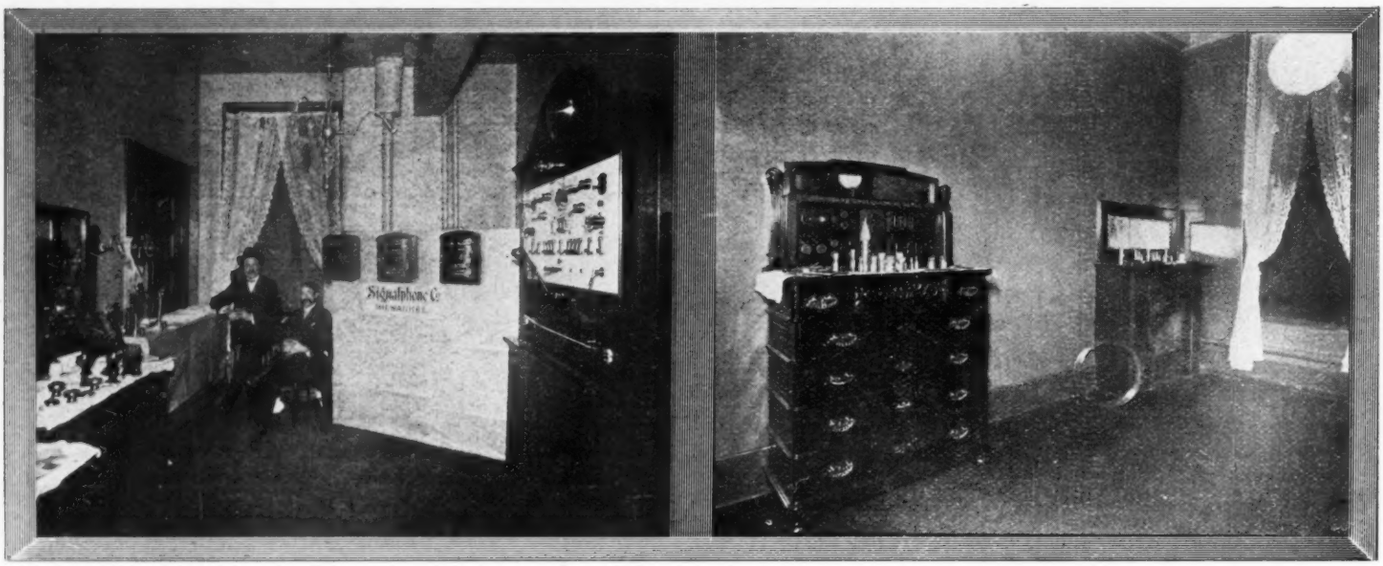
President Hull: Permit me to suggest that inasmuch as the resolution passed last year left this to a board, such matters should come before the state board, where there are state boards, and otherwise before the national board, so that for this session alone, if the motion carries, the matter will probably go before that committee.

Mr. Tetu: I think it is entirely pertinent to this question to determine who are and who are not eligible to this association. I do not blame the Bell people for trying to get into good company—I was a Bell man myself once—but I do insist that the question should be raised before the business of this convention goes any farther, as to who is and who is not eligible to membership in this association. (Applause.) We have nothing to be ashamed of, nothing at all, but we have information in our possession that the Bell people would be glad to get hold of and we are not ready to admit that we have such information in our possession. Now Mr. Schlosser of Gibson City made reference to the gentleman from Kentucky, I do not know whether I am the one he alludes to or not, but he made mention to what I said last year, or some one else said, that they



STERLING ELECTRIC COMPANY.

STROUD TELEPHONE SPECIALTY COMPANY.



SIGNALPHONE COMPANY. STANDARD UNDERGROUND CABLE COMPANY.

had some association or connection with the Bell company. I want to go on record right now as saying that I have no connection with the Bell people and I have never had any connection with the Bell people, and so long as I remain Independent, I never will have any connection with the Bell people, so I would like to have him announce to this convention as to who that gentleman is.

Cries of "Question."

The question being put the motion was unanimously carried.

President Hull: Immediately after the next paper I will appoint that committee. We will next hear from Professor J. C. Kelsey of Purdue University on "Standardization of Apparatus." (Applause.) It now gives me great pleasure to introduce to you Professor Kelsey.

Professor J. C. Kelsey then read the following paper:

STANDARDIZATION OF APPARATUS.

Before railways had grown to such extent that they had reached the terminals of other railways, each system made use of its own particular standards. For instance, one system had a broad-gauged track and axle, another a narrow gauge and still another an intermediate gauge. When conditions due to modern business methods demanded a rapid and uninterrupted interchange of traffic between all parts of our country, the terminals of a certain system were extended to meet the terminals of another system, and a common width of track and axle became necessary. This resulted in what is called the standard gauge, and now all rolling stock is built to operate on this gauge, making possible the fast freight, and comfortable through passenger service of the present day.

When telegraph companies were operated by different managements in the different districts of the country, each management had its own particular style of apparatus, and manner of operating it. Some systems used fast machine operating, and others, the slower manual method. As a consequence the systems could not be operated as a unit, and much time and expense was necessitated in getting long-distance service, because each system had to operate and record the message in its business way. Like the railroads, the telegraph met a demand for through service between cities and districts, and this necessitated a similarity in the style and usage of apparatus in both sending and receiving systems. This similarity or standardization has given to the public a more rapid and reliable telegraph service.

Telephone systems, trying to compete in the transportation class, are naturally encountering the same demands that were made upon the telegraph and railway. No longer can the telephone subscriber be confined to a limited district. He desires to talk to his neighbor, and that neighbor may be one mile or forty miles distant, or he may be one thousand miles away, in another district.

Whatever the case, the subscriber wants to hear his neighbor's voice, or his customer's voice, or his client's voice, just as plainly as in ordinary conversation, and he does not care to have his message repeated by an operator, any more than the passenger bound for New York would care to change cars at Cleveland and Buffalo. Therefore, successful competition in telephone transportation demands standard tracks, that through connection may be made, and efficient apparatus that will operate as a unit with this track, at both sending and receiving ends.

Experience has already decided the gauge of the telephone transportation track. It is a metallic line composed of No. 8 B. W. G. copper wires Whatever the locality of this track or line, its characteristics are in general the same. It is a well-known fast that this line must be transposed, and well balanced to be quiet under all disturbing conditions. If of a considerable length, it becomes very sensitive to unbalances, and upon connection with a local exchange subscriber, will quickly prove the unbalanced condition of the local switching apparatus, which would never be disclosed by a short toll line, or a purely local line. But if this toll line extend into territory where trolley and high tension and electric light wires abound, it develops still more decided characteristics. It becomes supersensitive and may be said to be looking for trouble. The unbalance that the long unexposed toll line would not detect will now be disclosed by a roar so great as to forbid conversation.

As the interurban lines with their accompanying high-tension wires invade the country, each and every exchange operator will inevitably experience this changed condition of his toll line. His local lines, and switching apparatus, which once gave him good toll service, will be rendered comparatively useless, as the oversensitive toll line will not permit of the least unbalance. If this oversensitive line connects with an exchange using series drops in circuit, the connection will be too noisy for use. If it connects with a common return system, great noise will result. If it connects with a metallic exchange, with lines having bad joints and careless structure, the connection will also be too noisy for use. If it connects with a well-balanced metallic system, using cheap or poorly designed transmitters, poor transmission will result. If it connects with a common battery system, using twenty volts battery pressure, the connection will be noisy, and the signals will be rendered inoperative. The same condition will apply to the forty-volt common battery system; therefore, in view of the great number of Independent exchanges, it is not likely that every exchange owner will consent to the making of radical changes. He will consent to any moderate change that will ameliorate conditions, and luckily, the repeating coil, if properly designed, will accomplish the result. This sadly neglected device must receive first aid and attention in the campaign of general standardization.

What does general standardization mean? Does it mean that each and every system shall be manufactured by the same company? No! Every company can manufacture standard drops, relays, ringers, generators and other devices. It means that a standardized system is one, if applied to local battery, that will operate in direct conductive relation with the standard toll line track, without the least noise due to unbalance, thereby giving absolute sway to the voice-tones. To attain this efficiency, a system would have to have balanced and well-insulated metallic lines, 1600-ohm bridging bells, 1000-ohm clearing-out drops, and open-circuit generators. The absence of repeating coils and series apparatus would be quite conspicuous. If it is necessary to have a grounded party line enter the standard exchange, a suitable repeating coil should be placed in circuit between the terminal arrestor and the line jack.

What would be a suitable repeating coil? Can a single standard repeating coil be made? No! There is more difference in repeating coils than in any other telephone apparatus. Like lightning and power transmitter formers, repeating coils should be built for load and frequency and carefully constructed. But as they

are not a part of a standard system, no time will be spent on their characteristics in this paper.

What is a standard common battery system? It is one that will give a quiet line connection and efficient transmission between the long-distance points. But strange to say, at this very moment there is an idea gaining ground that common battery transmission has not come up to standard. As a result one will find many companies maintaining local battery stations for long-distance service. It is an unfortunate condition, and I am compelled to admit the justification of the idea. The blame does not rest upon the system, because all transmitters have a central source of energy, for no reason can exist why a common battery transmitter cannot be made just as good as a local battery transmitter. Nor is it a question of battery voltage, for on local service one cannot tell the difference between ten, twenty or forty volts, transmission being the best in all cases. But why is there difficulty upon long-distance connections? It is because of the generally mistaken idea of the value of the electromotive force of the alternating currents of common battery voice-currents, which leads to the improper design of the repeating coil between the common-battery subscriber and the long-distance line.

In explanation, a comparison will be made. It is conceded that a local battery induction coil must have comparatively few turns in the primary and a great number of turns in the secondary in order to transmit a small amount of current at a high pressure and avoid the losses which would result from heavier current and low electromotive force. We will all admit that if this induction coil had equal turns on secondary and primary, we could not look for very good results on long-distance service. This is precisely the difficulty the common-battery systems are contending with. They use either repeating coils of equal windings of no potential raising power, or condensers with the effect exactly the same and then expect a low electromotive force to transmit the voice-currents to great distances. The electromotive force of common-battery voice-currents is very low and it is safe to say that it does not exceed the primary voltage of local battery instruments. If it is necessary in local battery practice to raise this low primary voltage to a high secondary voltage, running up into hundreds, why is it not necessary for the common-battery systems to adopt the same practice? Common-battery systems can be standardized, and the subscribers deserve it, for they do the bulk of the long-distance business.

Long-distance service has caused the cry for standardization. The American Telephone & Telegraph Company has heeded the cry and is bending great energies toward this necessary state. The Independent interests must also heed the cry. They have successfully fought local competitive conditions, and the long-distance field is the battle-ground of to-day. Manufacturer and operator alike must turn from local conditions and look towards their neglected long-distance field. Toll business offers opportunities for revenue that should not be neglected. What operator would refuse to lease each side of his toll line for telegraph purposes at from ten to twenty dollars a year per mile and still retain the integrity of his telephone privileges? And how many operators know how to accomplish this result and to what manufacturers of telephone apparatus can they look for reliable information and standard apparatus? Truly, the operator has fought his licensee competitor with great odds against him as far as a source of knowledge and experience is concerned.

A standard, satisfactory standardization of apparatus can be attained when each and every telephone operator can have the means of finding out what apparatus is standard. The only institutions that have the power to name the standards are the various state, inter-state and national associations. Let the Inter-State Association take the initiative and name a standardization committee composed of engineers of various companies, empower them to make terms and report at the next convention, or to encourage the annual meeting of the engineers and traffic managers of the operating companies, the consulting engineers, and engineers of the manufacturing companies, under the auspices of, and at the time of, the Inter-State convention, with plenty of time for papers, reports of tests, discussions and expression of opinion. I believe that meetings of this kind will do more to bring order out of chaos, to establish a uniformity of local and long-distance practice and bring about a general standardization than any other process. The hope of standardization in Independent circles lies in a combination of individual effort on the part of the engineer. Let all companies cheefully pay his expenses to the annual convention. Results will justify it.

Mr. Bellamy: There was a vast quietness that came over this audience when Professor Kelsey took his seat, and doubtless it was because of the fact that his paper is so ably constructed that nobody was able to discuss it. I know that was the case with myself, and it seems to me that there should be at least a resolution of thanks in recognition of the paper tendered, and I therefore move that this convention tender him its thanks for his excellent contribution.

The motion was seconded, and, the question being put, the motion was unanimously carried.

President Hull: Will Mr. Frazee take the chair for a moment?

(Mr. Frazee assumed the chair.)

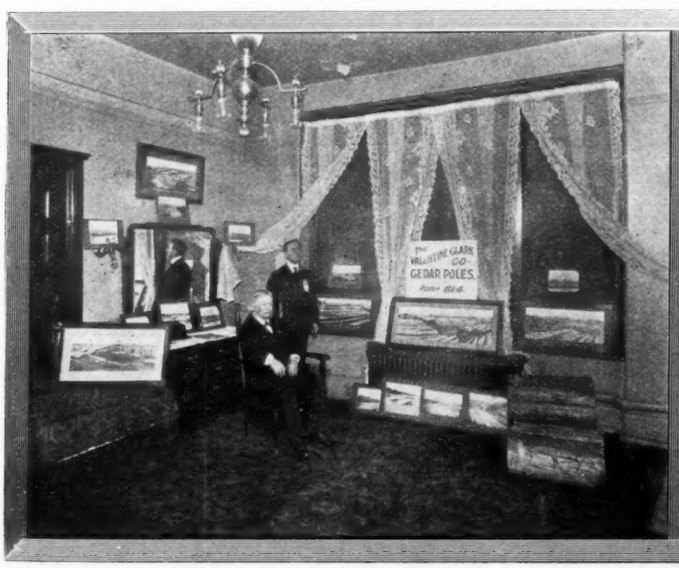
President Hull: I will ask you to excuse me for a moment, but before leaving and before Mr. Polk's paper is read I will appoint the committee on credentials, as follows: Tetu, Kentucky, chairman; Splane, Pennsylvania; Heseltine, Ohio.

Secretary Coleman then read Mr. Polk's paper, "Standardization of Construction," as follows:

STANDARDIZATION OF CONSTRUCTION.

I take it that my subject may be interpreted to mean not so much as to what shall constitute standard construction, but as to whether construction should be standardized and how such standardization can be brought about and made effective.

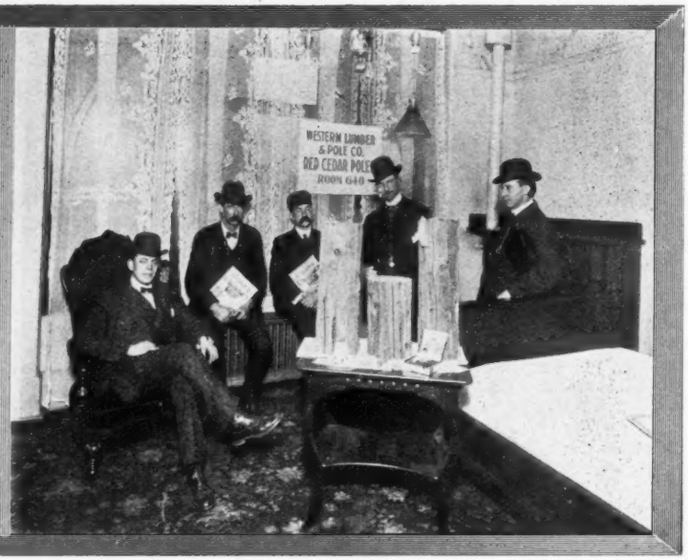
As to the first proposition, "What should constitute standard construction?" I will not attempt to answer, for the reason that I believe no one person is capable of nor should presume to tell this convention of what standard construction shall consist. Not that we do not have among us capable engineers and construction superintendents, but that all of us in our experiences and operations have been confined to more or less local fields with comparatively short periods of observation under various conditions. For these reasons we are incompetent to propose methods which shall be the standard and guide of us all and be applied upon all occasions, circumstances and conditions under which a company may be operating.



THE VALENTINE-CLARK COMPANY.

VESTA STORAGE BATTERY COMPANY.

WARNER ELECTRIC COMPANY.



WESTERN LUMBER & POLE COMPANY.

The conditions under which the numerous telephone companies have been organized and are operating are so varied that I feel safe in asserting that it is an impossibility for any one to formulate a set of specifications or plan construction which would be applicable in all cases and in accordance with which all companies could practically and successfully operate. Some one says it is not necessary that these specifications and plans be made up in detail, but that they should only cover certain general facts or principles which would apply in all cases and which if conformed to would be practical and result in universal benefit.

All right, we will start with an article which enters into and forms the foundation of construction of all modern plants in the majority of cities having a population of 35,000 and upwards—underground conduit.

There is the single duct, multiple duct, clay conduit, iron pipe, cement line pipe, cement conduit, paper conduit, creosote wood, etc., all of various sizes and shapes, laid in a variety of ways; all in use and all giving satisfaction to the parties using them. Which shall be standard, and how shall it be laid? Here are the manufacturers, each telling us his is the best, cheapest and most durable. We cannot use them all and at the same time have an effective standard. I am sure if we adopted one of the above as a standard and proceeded to utilize it as such, it would not remain the cheapest very long.

Go to the next article, which enters into the construction of all plants, whether large or small, modern or antiquated—poles. Shall they be cedar or chestnut? White cedar or red cedar? Northern cedar or western cedar? Cypress or tamarack? Shall they have four-inch tops or five? Six or seven? Eight or nine? Or even greater? What height shall they be, twenty feet or sixty? I can conceive of circumstances and conditions under which any of the above would be applicable. Which, then, shall be made standard and adhered to upon all occasions?

Now, as regards wire: (which, until Mr. Marconi gets a little further advanced, is a necessary adjunct to all telephone systems). There is iron and copper, both of varying gauges. Neither can be made the standard at present, for there are conditions under which either may be judiciously and successfully used, both with various gauges within certain limits.

There is cable: Of what sized wire shall it consist? What insulation? What capacity? What character of sheath? We cannot specify to which of the many qualifications it shall conform and say it must be universally used. I remember visiting a town a short time ago of less than 10,000 inhabitants and the manager of the exchange seemed to take pride in telling me that he had an underground cable system; cable up to conference specifications and all that. This system extended about four or five hundred feet from the office; cable of 19 gauge wire 0.08 capacity, 500 megohm insulation. The specifications were good, if the cable had the qualities enumerated, and should be required in certain cases, but in the particular instance cited the manufacturer simply used these qualifications for an excuse for charging an exorbitant price for his goods. Cable of 22 gauge wire, 0 12 capacity would have served just as well and operated as satisfactorily, and cost less money.

We could go on through the list of construction material, including cross-arms, cable-boxes, terminals, protectors, hardware, etc., and meet with the same situation and reach similar conclusions to those outlined. In view of the above facts, it is certainly clear that it would not be safe or wise to say, at the present time at least, as to what shall constitute standard construction.

Going to the next proposition as to whether construction should be standardized: Certainly, if it is practical and possible to do so. Under present conditions I do not believe that it is either possible or practical to have a standard of construction in the Independent telephone field. The primary reason for this belief lies in the fact of there being such a large number of separate and distinct organizations constructing and operating each with its individual and personal ideas which it insists upon following, regardless of results for good or evil thereby inflicted upon its neighbor; also the fact of the large number of manufacturers and supply houses from whom it is possible to purchase material and equipment, precludes the possibility of an early standardization. All of these manufacturers produce certain articles which are good and which any operating company could wisely purchase. As a large number of these manufacturers produce articles of the same character and for the same purpose, but of a different type, the possibility of standardizing them is prevented, for the present at least. Also, owing to the recent developing of the business, Independent telephony is in its evolutionary stage. New ideas and inventions are being brought forth, we might say almost daily, which prove to be improvements over previous materials used.

We should not, therefore, retard the progress of these improvements for the sake of keeping to a standard. Whenever we reach a time when this evolution seems to have reached its zenith, if it is possible for this condition ever to arise, this will be the opportune moment for standardization.

Another fact which stands out very prominently before us all is the conditions of our adversary, the Bell company. It is operated as nearly as it is practicable to do so by one dominant power. It purchases its equipment and supplies practically from one and the same source; yet we all know from observation that it has been unable as yet to reach any satisfactory stage in standardizing its equipment or methods of construction. Travel over its territory and you will find equipment of various kinds and types and all character of construction.

I realize that although the Bell Telephone Company may have failed up to the present time to reach the goal, it does not prove that the Independent companies could not do so. We are aware, all of us, that the Independent companies have been able to accomplish and bring about improvements that our adversaries either could not or did not accomplish; yet the fact of our adversary's failure to accomplish the result which we know it has been endeavoring to attain indicates that we have a very formidable barrier to overcome

Although it appears that the time is not ripe for our complete success, the question arises, "What can be done to make our progress more rapid, that we may reach our aims as quickly as possible?" At the present time, there is no doubt that large sums of money are wasted on account of the lack of uniformity. We see companies being constructed and operated under conditions as favorable for one as the other, yet one is more successful than the other. Usually the causes which bring better results for one than for the other can be traced to its method and character of construction. In fact, failures, due to faulty construction, have been narrowly averted. It therefore seems that although we may not be able to bring about uniformity, we should begin to formulate plans that would enable and prevent our weaker brethren from coming so near to failure and bankruptcy.

Another feature which makes it very important for us to have some general methods, is on account of the necessity of enlisting

new capital in the field. A promoter obtains a franchise and completes all the necessary preliminaries for beginning the construction of a plant. The conditions are all good, and if the proposition is properly managed there is no doubt of the venture proving successful. The promoter goes before the capitalist with his prospectus. The capitalist is very favorably impressed, but before taking final action he calls upon an engineer to make a technical report. This engineer possibly may have had large experience, but in a limited territory under certain conditions. The conditions in the prospective new field may be extremely favorable, but entirely different from those with which he is familiar, and would call for entirely different modes of construction from those with which he is familiar. The result is, he applies his methods to the new field and makes a very bad showing. The capitalist turns down the proposition. This is a state of affairs which is wholly wrong, and unfortunately very often happens.

It seems to me that if we had some national organization board, composed of experienced and practical telephone engineers and construction superintendents, made up from representatives from all parts of the country, familiar with all the conditions and operating features in their various localities, to whom financial men and investors could call upon for advice, results would be more satisfactory. This organization necessarily could not act as a body in all of these cases. However, it could have a standing committee whose personnel would be of its best and most experienced men; these men to be broad and liberal in their views. These parties to keep an eye upon the new propositions coming up in their respective territory. The operating owners and managers in these various sections or territories to be kept advised of this active representative of the national organization in their territory; acquaint them with the fact that they could feel at liberty at any time to call upon this member for advice. This member, in matters to which his attention is called, to only act personally in trivial or unimportant cases. All important matters brought to his attention to be referred to the general committee, and especially all new propositions or large ones calling for new and large investments.

In this way, the new investor or new operator would have a means of knowing where he could turn at any time for advice which would be conscientiously and intelligently furnished. By this means also we would eradicate the most persistent evil standing in the way of successful and rapid progress of Independent telephony at the present time,—individual personality. The successful issue of a proposition to-day depends too much upon the personality of one individual who persists in carrying out his own personal ideas regardless of the judgment or advice of associates.

You will probably say, "What if the new promoter does not turn to your committee, and if not, what means has your national board or committee of asserting itself?" It can do this: If the new organizer or promoter called upon outside sources and his prospective investor was incompetently or illy advised, your committee's active representative would immediately bring the matter to the national body's attention, and its national officers could take the matter in hand and take it upon themselves to see that the proper parties were properly advised; and by intelligent and dignified procedure show wherein, from whom, and in what manner, the ill advice had been given. It would not be long, I believe, until irresponsible and incompetent individuals would lose their prestige, especially in operations of any magnitude.

I realize that we are deviating somewhat from the course indicated by our subject. Nevertheless, I believe you will agree with me in the impracticability of accomplishing the results contemplated by our subject, for the present at least, and at the same time agreeing that such results ought to be accomplished. In the meantime, we should be doing something to help bring about the desired end whenever the opportune moment does arrive. It therefore occurs to me that what we should work for at present is to eliminate personality and strife between ourselves and get the better results which are bound to come from united or combined action.

The question then presents itself, "How shall we get the united action or results which shall be the best that can be furnished?" This I believe can be done something after the plan I have indicated. It possibly will take time, perseverance and considerable labor on some one's part to put the machinery in motion. The officers of our various associations and trade publications could work it out again and in time have the machine in successful operation.

In order to obtain membership in this national organization, candidates should be very carefully chosen, and entrance to it shall be very closely guarded; only persons of certain minimum number of years of actual experience and practical construction and maintenance of telephone properties should be chosen. Its membership should predominate with practical engineers and superintendents of construction, and not with owners and investors. These men to be chosen on account of their broad experience, broad views and strong personalities, who could be relied upon to give proper advice without fear or favor. The expense of the maintenance of such an organization should not be great and could be maintained by the various telephone associations. I believe the results that would be obtained from the operation of such an organization or bureau would do more towards bringing about standard methods of constructing and operating telephone properties than anything else that could be done at the present stage of development.

The problem which most frequently confronts the present construction engineer is that he is called upon to construct a plant complete; required to accomplish certain fixed results and put the system upon an operating basis for a specified amount. A large number of items of cost of promotion and organization over which he has no control are incurred, and as these increase, the amount allowed for construction is decreased. Then arises the necessity not of following standards and specifications, but of using judgment as to the best that can be accomplished for the means available.

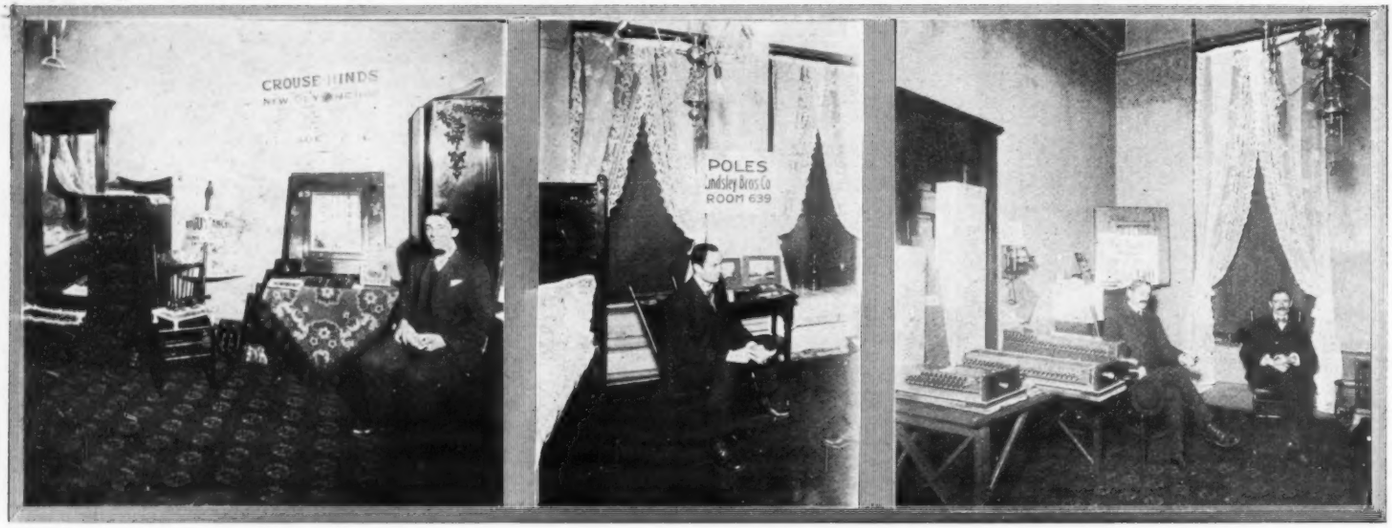
Therefore, good construction at the present time is as much an attribute of following fixed standards and plans as it is the result of individual personality; of being able to meet the local conditions in the best possible manner, using the best materials directly at hand and keeping well within the amount of means available.

(President Hull here resumed the chair.)

President Hull: Now, gentlemen, these two preceding papers are open for discussion, after which Mr. Critchfield for the Automatic company will have something to say. We would be glad to hear from any member of this association along the lines suggested in these papers on the standardization of apparatus and construction.

Mr. Bellamy: I would like to ask Prof. Kelsey what distance he would consider No. 8 copper suitable to transmit voice currents?

WESTERN TELEPHONE MANUFACTURING COMPANY. WILLIAMS-ABBOTT ELECTRIC COMPANY.



CROUSE-HINDS ELECTRIC COMPANY. LINDSLEY BROS. COMPANY. MOON MANUFACTURING COMPANY.

Prof. Kelsey: My paper considers long haul business. Under proper conditions a No. 8 copper wire ought to carry 1,000 miles.

Mr. Bellamy: How far would you consider No. 10 to be suitable?

Prof. Kelsey: Well, No. 10 would work 300 or 500 miles, but it would not do as well as No. 8.

Mr. Bellamy: Would you consider No. 10 suitable for 400 or 500 miles?

Prof. Kelsey: Yes, if you have the instruments and the circuit clear.

Mr. Meyer: I think these subjects are of great interest to this convention, and if there can be anything done along this line the committee that is in charge of a sort of a reorganization of this body should take the matter in hand if it comes within its scope in any way. If anything can be done towards standardizing either apparatus or construction I think it would be well to do so. To some extent at least it is practicable. In one of the papers on construction the point was made that if we had a standard of wire, or a standard pole, or anything of that kind, the price on those articles would immediately rise and we would have no use for other sizes. I take it there could be a standard to some extent owing to the conditions. As to a No. 10 or No. 8 wire I don't suppose that any of the companies here will ever want to run long distance lines of sufficient length so that it will be necessary to use No. 8 copper. We need these connections, however, and there should be a company using such a wire, and such wire should be a standard, I think, for that purpose. Again, there could be other standards used for other distances, and so in the pole line construction, I think, as to the spacing of the wires, owing to the number of wires we have, and all these things, that there could be a standardization of construction that would be to the advantage of all telephone companies. And whatever is the better way to bring this about, I think this convention should take some action on this matter that would lead to results, and I feel that it would certainly be to the benefit of all of us. I would be glad to hear from others on this point.

Mr. Thompson: The papers just read were both most excellent. The points made in them were worthy the careful attention of this association and I presume every operating manager within this hall this afternoon realizes the importance of the two papers. Now throughout these nine states one of the first things that organizers of new companies do is to come to Chicago—and if there is a place, I suspect, on the face of the earth that a man can be buncoed in it is in Chicago (laughter), and they leave an order with the telephone manufacturer to send them instruments, and he tells them his instruments are the only instruments on the face of the earth that can do anything at all, even to transmit speech. The result is that the manufacturers have shipped instruments down into our state and we have just about as many different characters of instruments as there are telephone companies, and their qualities are probably —well, a good deal worse than the number. Now that is the result of two things: first a want of good business capacity on the part of the persons who do the buying, and, second, a want of information which should be furnished by such an organization as the one proposed. We are coming to the standardization of apparatus. It is coming because the fellows who have a want of information and do the buying go into bankruptcy. It is coming because energetic business men, associations like this, are realizing the necessity of educating the people who go into the telephone business that they can not run a telephone plant without a standardized equipment. And so we are beginning to educate them.

I desire to say further that this telephone movement reminds me very much of the gas companies in years gone by; and of the electrical companies in years gone by. The fact of the matter is when the electrical light companies started in this country years ago, they could show a very nice prospectus, and men would come in and put up their money and they would buy this kind of apparatus, and that kind of an engine, and it would pay twenty-five per cent. We discovered, however, that while it was paying twenty-five per cent the profits were constantly going into new machinery and apparatus, and the result is that, notwithstanding we were making a profit, it all went into the plant and the stockholders got nothing. And so we have been doing in the telephone business what formerly was done in the gas industries, and it has been because of the fact that the people who have invested in it have not required a standardized equipment. If there is one thing that is needed more than anything else, it is to have such associations as this endorse a movement of the character proposed, so that we can get a high standard of equipment, not adopting any particular manufacturer's, but by disseminating the information to the people so that they will understand that they should get a certain character of equipment, and that equipment would enable them to connect with others who have perhaps a different manufacturer's equipment, but it had been standardized, and the result would be that each would be benefited by good service. I think, therefore, that it would be proper for the executive committee to take that matter under consideration and recommend the appointment of a committee

of engineers that they might designate, that they might disseminate such information and that that committee might have the approval of this association. (Applause.)

Secretary Coleman: I move you that this matter as suggested in these two papers under discussion be referred to the committee on permanent organization and a plan worked out so that standard apparatus can be used and adopted. (Applause.)

Motion seconded.

The question being put, the motion was unanimously carried.

President Hull: In response to the committee which visited the Illinois Telephone and Telegraph Company, I have now to advise that its representative, Mr. Critchfield, is present and will address you. It gives me great pleasure to introduce to you Mr. Critchfield of the Automatic Electric Company. (Applause.)

Mr. Critchfield: I am here at the request of Mr. Wheeler, the president of the Illinois Telephone and Telegraph Company, Chicago, to further answer some questions of the committee from this convention propounded to him this morning. I am not actively identified in the management of the Illinois Telephone & Telegraph Company, but with the Automatic Electric Company. I am not altogether fully advised as to what this committee wants to know. As I understand it, it was what the prospects were for a toll line connection with the Illinois Telephone & Telegraph Company's exchange in Chicago. I will reply to that first, and if there is anything further I will try and answer that if I can.

The telephone company here has constructed and completed twenty-one miles of tunnel covering points within the loop district and some extensions beyond that—the business part of the city—under each street. And I am saying this because there is a misconception in some directions. It is claimed, for instance, that this tunnel proposition is not a telephone proposition, but a freight proposition. Now it is not only a freight proposition, it is a telephone proposition, and it is a proposition which will be used for anything for which the streets of the city could be legitimately used for the use of public utility. The telephone cables are being strung in these tunnels and the connections are being made through the tunnels with the exchanges under the offices and buildings, and in that connection perhaps I might say that the same people who are interested in the tunnel company and the installation of this exchange are interested in the Automatic Electric Company, which is the manufacturing concern of the company.

The tunnel proposition was first conceived and it was a matter of inference that the telephone exchange which will be operated as a part of its tunnel proposition would not be interfered with or disturbed. As a precaution against that, they having decided to use the automatic equipment, they purchased the rights of the automatic equipment and the factories, so that it is one and the same thing. It can not be interefered with by any outside company. They are owned by practically the same people.

Now it is the purpose of the Illinois Telephone & Telegraph Company, as it ought to be of every other telephone company, to give toll line connections when it can connect with the right sort of apparatus; that is, apparatus over which you can talk. That doesn't mean that you must have our apparatus, but any company having a good exchange operating under proper conditions will stand on the same footing exactly as will the automatic exchange. I am not here to sell our equipment. The Illinois Telephone & Telegraph Company is trying to do business and it is simply a business proposition; whether it is a manual or automatic equipment will make no difference if the apparatus and the connection is all right.

There is one proposition, however, that will be considered, and that is that this company, the Illinois Telephone & Telegraph Company, is very anxious for good toll line connections, but will not give a toll line connection until good toll service can be given. It will not undertake to say to its patrons in Chicago that we will give you good toll line service; it will not advertise itself as offering toll line service until it can give a good toll line service that will be

THE GOLD ADJUSTAPHONE.

NICHOLAS SELECTIVE COMPANY.

TELEPHONY VISITORS.

satisfactory to the users. And I think some of you gentlemen have had experience perhaps in trying to get toll line stations in a town or city that you could not get into otherwise. When you do advertise a toll line connection with a city, everybody who tries it finds fault with it, and the result is that your toll business has not yet recovered from the injury it received on that account.

Now it is the purpose to take up and develop in the spring a plan of constructing some toll lines radiating from Chicago; not with a view of undertaking to handle the toll business of Illinois or Wisconsin or the adjacent states, but with a view of making connections with the toll lines in those states to handle the business by trunk line in a way that will afford the best possible service. The basis of contracting will be taken up and you gentlemen will be met or asked to make contracts with the toll line company. It will simply be such contracts as those that are common in the toll line business, a general toll line contract. But it must be with good equipment and with good apparatus, and the business will be handled from this end by a toll line which proposes to have, under an arrangement with our company, toll lines of perhaps fifty to 100 miles in length, in enough directions from Chicago to reach and meet all of the telephone companies in telephone business in good shape. Not doing a local telephone business, not competing with you gentlemen in the territory which is covered by your local business, but to bring the business into Chicago. And that will be taken up, not by the Illinois Telephone & Telegraph Company, but by another company which is now in embryo, but which means business, and the matter will be submitted to you before the building season in the spring. (Applause.)

President Hull: I am sure that this convention is very glad to have Mr. Critchfield with us and to thank him for the statement that he has made. I presume, as suggested in his talk, that if there are any other points of interest that he has overlooked, he will be glad to answer any question you may ask him.

Mr. Schuler (Illinois): I would like to ask the representative of the Illinois Telephone & Telegraph Company how long it will be before his company will be in a position to give toll line service out of Chicago.

Mr. Critchfield: Well, all I can say about that is that the work of construction will be begun next spring and it is not an easy proposition to build a telephone exchange in the city of Chicago. This territory that is now being developed is in the heart of the city; this tunnel proposition means ninety-two miles when completed as now contemplated. There are twenty-one miles already finished, but toll lines can be brought into the city before the completion of the tunnel. It is not necessary to wait for that. But to get out to the suburbs, twenty miles away from the city, South Chicago, for instance, it takes longer than it does to build twenty miles outside; it takes longer to get rights, permission to do business, etc., but it is reasonable to suppose a good entrance can be made into Chicago by next fall to all the telephones that are in use now or will be installed at that time. There are 10,000 telephones being installed in the present building, which is only a temporary building. We were unable to get possession of the grounds on which the main telephone building is to be built next spring, but in this temporary building are being put up 10,000 telephones, and the work will go right along in the sub-station following that, and I think it is safe to assume that a good entrance can be made into Chicago for toll line connections by next fall.

Mr. Wasson: I would like to ask if this is being built out specially to meet the Independent telephone companies?

Mr. Critchfield: Yes, sir; and when it does connect with them it will be Independent. We have no affiliation with the Bell company of any kind. (Applause.) We will not sell a telephone or switch to any man who is using Bell telephone apparatus. We have had opportunity to do it and refused.

Mr. Rogers: In view of the fact that this convention is composed entirely of Independents, we are particularly pleased at this statement. Are you able to state that your company is not, so far as you know, directly or indirectly connected with the Bell company?

Mr. Critchfield: Mr. Rogers, I have been in the Independent telephone business since 1894, when I fought the first fight, and I will answer you in my own way, if you will pardon me. (Laughter.) I investigated that question. It had been rumored, and I heard the rumor before I came with the Automatic Electric Company a year ago the first of this month, that it was a Bell concern. I could not afford, either by temperament or otherwise, to become allied with a Bell concern. I went into the matter very fully and since that time I have gone into it more fully, and it has absolutely no connection directly or indirectly, and the best evidence in the world that is so is that the people who have put $3,000,000 in the factory are investing $20,000,000 in a concern to fight the Bell Telephone Company with an exchange in Chicago. Now the Bell Telephone Company does not invest money to fight itself and to cut rates and to make it trouble, and I simply want to say unqualifiedly and unhesitatingly that it is not affiliated or connected in any way with the Bell company, nor is any of its stock held by a Bell man unless the stock has changed hands and nobody is aware of it. (Applause.)

Mr. Rogers: Mr. Chairman, if the question had not been asked when the announcement of the committee was made, I would not have put the question to Mr. Critchfield.

Mr. Critchfield: The question was all right.

Mr. Rogers: I had understood that there had been some statements made that the Strowger Automatic Company was a Bell concern, and I could not believe it, and that is what led me to ask the question.

Mr. Critchfield: That is just a repetition of that old story. Every time a new telephone company is started, as I understand it, about the time it is reaching its successful stage the charge has been made that it is a Bell concern, but I say in our case it is absolutely, positively and truly an Independent company, and the men who know me know this is so.

Mr. Rogers: I have no doubt about that, and your answer fully assures me.

Mr. Critchfield: I am glad the question was asked.

President Hull: I notice that the chairman of the committee on credentials is with us, and we will be glad to have his report.

Mr. Tetu, chairman of the committee on credentials, then read the following report:

REPORT OF THE COMMITTEE ON CREDENTIALS.

Your committee to whom was referred the question of membership begs to report that inasmuch as the time will not admit of a thorough canvass being made, the association must depend upon its loyal members to make known the presence of any one interested in any enterprise antagonistic to the Independent telephone movement.

It further recommends that at future conventions no one be admitted to sessions of the association except upon presentation to a regularly appointed doorkeeper, of a certificate bearing the endorsement of the company or firm he represents, and further endorsed by the secretary of the association.

A. L. Tetu, *Chairman.*
J. W. Splane.
W. M. Heseltine.

Mr. Tetu: I move the adoption of the report.

The question was put and the motion carried unanimously, and the report was declared adopted.

On motion the meeting then adjourned to meet at 9 o'clock a. m. Thursday, December 10, 1903.

THIRD SESSION, THURSDAY, DECEMBER 10, 1903.

The convention was called to order at 10 o'clock a. m. by President Hull, who said:

"We have the report of the committee on temporary constitution. You remember, yesterday, the committee selected

reported a permanent committee and advised that a permanent committee be appointed to perfect the permanent institution of this association, and a committee had been selected by that committee who should report a constitution which should be in force until such time as we could consummate the incorporation of the association. That committee is now ready to report, and the report is in the secretary's hands and he will read it. There are very few changes made in the present constitution."

The secretary read said report as follows:

Name.—The name of this organization shall be the Inter-State Independent Telephone Association of America.

Object.—The object of the association is to promote the general welfare and interests of the Independent telephone companies operating in all the states east of the Rocky mountains and such other adjacent territory as may be deemed advisable to admit.

Section 1. Each operating Independent telephone company within the state board is entitled to become a member of the association upon the payment of $5, and to one vote at the meetings of the association, but each may send as many representatives as each company may desire. Manufacturers and supply dealers may become associate members on the payment of $5, but shall not be entitled to vote at any meeting of the association.

Meetings.—Sec. 2. Annual meetings of the association shall be held at such time and place as the executive committee and officers may determine.

Officers.—Sec. 3. The officers of the association shall be a president, vice-president, secretary and treasurer, each elected for a term of one year and shall serve until their successors are elected, and shall perform the duties usual to such offices.

The officers and executive committee shall be nominated by a special committee of seven, appointed by the president, and they shall be elected by a majority of votes in the convention.

Officers shall not be elected for two consecutive terms, except in the case of the secretary.

Salaries.—Sec. 4. No officer shall receive a salary except the secretary, who may be paid such compensation as the executive committee may determine.

Executive Committee.—Sec. 5. The executive committee shall consist of nine persons from nine different states of all states present. The executive committee and officers shall have full power between meetings of the association.

Dues.—Sec. 6. The annual dues shall be $5 per member, active and associate, and shall be due on February 1 preceding the convention.

Quorum.—Sec. 7. A quorum of the association shall consist of not less than fifteen active members. A majority of the executive committee present shall constitute its quorum and at least ten days' written notice shall be given by mail to each member by the secretary, and meetings may be called at any time on request of two members of the committee or secretary.

Amendments.—Sec. 8. These articles may be amended at any regular meeting of the association by a two-thirds vote of the members present.

Secretary Coleman: Mr. Chairman, I move the adoption of this temporary constitution and by-laws as read.

Motion seconded.

Mr. David Prewitt: It occurs to me that there should be an amendment requiring that dues be paid at a fixed time and that after that time they shall become delinquent and a penalty affixed to them. Every year a considerable amount of money must be advanced by the association which takes its chances on the members coming here to pay up. Other bodies or associations don't take such chances. I think we ought to put in the constitution that the dues are due at some time during the year, and after that they become delinquent, and adopt a penalty. Make some provision as to the time the dues should be paid. I make that as an amendment. Make the time the first of July of each year.

The amendment was seconded, and carried.

President Hull: The question now recurs upon the adoption of the constitution as amended.

Amendment to the constitution adopted.

President Hull: The next item on the program is a paper left over from yesterday, "Competition between Independent Companies and Farmers' Mutuals," by O. Rex of Indiana. Mr. Rex is necessarily absent at this time on committee duty, and the secretary will read the paper.

The secretary then read the following paper:

COMPETITION BETWEEN INDEPENDENT COMPANIES AND FARMERS' MUTUALS.

Mr. President and gentlemen: Being assigned a place on the program and requested to prepare a paper on the subject, "Competition Between Independent Telephone Companies and Farmers' Mutuals," I beg to submit, with your kind indulgence, this brief review.

The development of the telephone business has been, in the past few years, phenomenal. With such gigantic strides has the business enlarged and advanced that the business world has never seen such progress. It has developed with such rapidity that very few men have comprehended the vast amount of capital already invested therein or the future possibilities.

The local manager of the Independent telephone company is a busy man. In the past he has not had the time, or he has not taken the time, to consider the far-reaching possibilities of his business. He now finds himself, in many cases, facing two dangers: First, the Bell company, with all of its experiences and queer ways, and, second, the farmers' mutual companies. These two elements of danger are the ones that the Independent telephone companies must meet. The Bell company condition we fight; that goes without saying. The farmers' mutuals we must do something with. In some localities we have almost lost sight of the Bell company. We must not think, however, that it has left the field, for it is still in evidence. From signs perceptible the Bell company is exercising a dangerous influence through some of the manufacturers.

I have a personal knowledge of one case where the representative of one of the leading manufacturing companies devoted two weeks of his company's time promoting an exchange in opposition to one of the pioneer Independent telephone companies in Indiana, when said agent was urged by the manager of the old company not to encourage another company in the same town he made reply by saying that his factory was making goods to sell, and he could sell the equipment at a much better profit to the new concern than he could sell to the old company. We also find the agents of the Bell company organizing the farmers and offering them very low rates as an inducement to connect with its lines, and sometimes succeeds in getting them. Now the farmers throughout this country are demanding telephone service, and in most cases must and will have it, and necessarily must have connection with the towns in which they do their trading. The question is, how are we to handle this problem without loss to the local company? The local exchange manager can not build lines to them, in many cases, because his capital is busy keeping up town service, and in other cases the revenue derived therefrom is not considered sufficient to make the investment a profitable one. The solution of the problem is up to us all, and especially to those of us that are operating exchanges in the smaller towns and cities. I beg to suggest a mode of taking care of the farmers which to my mind is a safe way to handle the business. Encourage the organization of farmer companies and put yourself on friendly terms with them; give them the help that you are able to give from your knowledge of the telephone business and thereby enable them to construct their lines and install their equipment in a manner that will give a satisfactory service to themselves and the exchange with which they are connected. The farmers throughout the land, as I have said before, are demanding and will have telephones and they are, as a rule, willing to put their money into the construction of rural lines, and by your friendly attitude towards them you can in most cases make arrangements for exchange service that will pay operating expenses and sometimes a profit, but if it only pays the necessary extra operator it would be better for the exchange than to allow them to fight their way into the town and ever after be your enemy. Hoping that this brief paper will lead to a free discussion of the subject by the delegates present and that we may be able to decide on some plan that will conform with the best interests of the exchange owners, and also the farmers, and that energy that is now spent in strife will be expended to further the interests of all parties concerned.

President Hull: Is there any discussion on this paper? Are there any of our farmer friends who have anything to say about it?

Mr. Taylor (of Indiana): I have been fighting for your cause for thirteen years, and I know one fact I think will be interesting to you. There is an Independent telephone company at Lebanon, Indiana. An action was brought against that company six months ago by a mutual company at Cornell, asking and demanding that the Lebanon company be compelled to exchange business with the Thorntown-Walker company. The Lebanon company had before that time made arrangements with one or two companies and the judge ruled, inasmuch as the Lebanon company had made exchange arrangements with one company, it must exchange with all. In other words, it must give the benefit

and use of its exchange to the corporate company. I came into the case at that point for the Lebanon company.

President Hull: In what court was that?

Mr. Taylor: In the Lebanon Circuit Court of Indiana, and I got a reopening of the case, and it is now pending for decision by Judge Arnold, and the question there is whether the Lebanon company can be compelled to exchange with all the mutual companies. There is a tremendous interest to all of you.

Secretary Coleman: What is your legal opinion?

Mr. Taylor: My opinion is that they cannot do it, but, of course, I am the lawyer on that side of the question.

Mr. Thompson (of Ohio): Can you find any law on the other side of the question?

Mr. Taylor: I think I can, but not in terms. That particular question as to whether or no a telephone company can be compelled to exchange with another has never been raised before in law. I am fighting the case upon the ground that it has been decided in a great many railroad cases, other cases of similar character in our favor, that ought to settle this point.

President Hull: I understand the question is not a question of a common carrier accepting business from another company for pay, but a question of accepting business from them without pay.

Mr. Taylor: Without pay.

President Hull: You say a circuit court judge in Indiana has decided you must accept business from a rival company without pay?

Mr. Taylor: Yes.

Mr. Thompson: Mr. President, I made the inquiry, but perhaps many of the gentlemen present didn't comprehend why I asked it. In the vernacular of the profession, the word "law" means something that is only understood by attorneys, and the definition of law is, the decision of courts. I undertake to say the matter has never been decided by any court in the United States.

Mr. Taylor: That is right.

Secretary Coleman: You mean in any court of final resort?

Mr. Taylor: Never.

Mr. Zimmerman (of Kansas): Kansas is making great strides in the telephone business. In my county there are fifteen or twenty cities that have Independent telephone connections. We have possibilities of toll connection for 100 miles. Everybody pays fifteen cents toll between towns in that county with the exception of such exchanges as are in the small hamlets four, five and six mile points. One question I have never heard spoken of in this convention is the right of telephone companies on public highways. I don't know what these rights are in other states, but in Kansas the telephone people have always had the idea that telephone companies had the right of public domain. There was a decision within the last few months by a supreme court judge that telephone companies have no right on the public highway except such rights as are gained from the farmers along whose lands they run the line. That is a question that is closely connected with the farmers' question. It makes them a little more independent. The decision was rendered three or four weeks ago and we have not felt the effect yet. In many of our localities there is not a farmer of any means that has not a telephone. Some of the Independent people with practically no means, no more than enough to buy a switchboard and run a wire into the city limits, are giving the farmers telephone service for fifty cents a month, the farmers building the lines and keeping them in repair. I have never worked in that way. I have built the line and equipped the entire plant and given service at a nominal rate. My rates have been higher than a great many of my neighbors' rates. A neighbor of mine on the west, who has been in the business since it has been possible for the telephone people to have a telephone, feared the Bell. The Bell company had already made arrangements with some farmers. This man was very much scared, and he said to the farmers, "You fellows build your lines, put on your telephones, establish your central, so you will be connected with my toll line, and I will give you free service to every farmer in the county." You can readily see the effect on the man charging $25 for the first year and $18 after that. The result is that there is great activity among the farmers. They served notice on me only a few days ago that they wanted to see me in my town next Saturday. That question is one of vast importance to me, and I will see them. I would like to know what the facts of the case are with the telephone people in Iowa, Missouri, Illinois, Ohio and other states represented here.

Mr. Prewitt (of Kentucky): I would like to say to the gentleman that by a decision of our Court of Appeals we can run tram cars, telephone poles, telegraph poles, electric cars, railroad trains or anything but a steamboat on our highways. (Laughter.)

Mr. Knapp (of Ohio): I would say to the gentleman from Kansas that the rate, $25 a year, is too high in the first place. We have had some experience with a number of telephones and are getting $16 a year and think we are doing pretty well. We have a number of them for which we are only getting $1 and some $1.25. We have an exchange in one little town where they couldn't take care of the farmers fast enough. We have about fifteen towns we are interested in, and the only opposition we have had is in one county seat, Norwalk. In Attic, we couldn't take care of the people quick enough, and they organized their own company. The Bell company put in service and it didn't affect us except that we had to put in telephones for $1.

Mr. Zimerman: We have charged $25 for the first year and $18 after that.

President Hull: What is your rate in the town adjoining? Where you charge $18 a year what do you charge people in the towns?

Mr. Zimmerman: Twelve dollars.

Mr. Rogers (of Iowa): The question that the gentleman from Kansas raises does not seem to me to be answered with that seriousness that the question should be met with. It is the backbone of the whole contest between the Independent and the Bell companies, with their numerous creatures and allies and tools. In my state, the supreme court has just decided that the highway is subject to occupation by the corporation. The decision in its full scope is erroneous. It is founded neither upon fact nor upon the principle of the use of streets in the interest of the community, and I am sure before another year goes by we will have the supreme court reversed. The unfortunate thing is that judges have not had the time to discover that the dissemination of knowledge and the transmission of intelligence is a very much greater proposition than allowing a few railroad companies to wander at will over the highways, and after they have acquired that right, never to do any public service except upon the basis of some combination that may have been made in the East. The principle of highways has been established so far as the contest between corporations is concerned, again and again, by the courts of the states, and by the United States supreme court. There can be no dedication of any place in the United States, under the common law, except in the interest of all of the people, and the occupation by any person or set of people of any portion of the highways, must be made in view of that principle. Unfortunately, people in times of prosperity do not observe or know of all their rights. The corporations employ the best attorneys. They have not any interest in letting people know the facts, and here is the vital proposition: Going on the highways (and the occupation of towns, which is a similar question), is being differently viewed in the various states. Under the common law, under all law in the United States to-day, the individual can never dedicate to a city,

even if it was by warranty deed, with no qualifications whatever, the right of that city to pass for any length of time any of the rights common to all of the citizens, without the same being subject to change in view of the interest of the individual in common. In other words, if I own a piece of property on a corner of a block in a city and I am willing to give an easement to anybody off of my property and the person on the other side of the street is willing to give me an easement and you don't disturb the occupation of the city of the street, I can go there. If people will assert themselves, and learn what they can do in the telephone business, they can make any connection with their property, by going under the street surface. There isn't a decision by any of the courts that has not the backbone of this declaration I am making. I propose to raise that question. There is hardly a member of our supreme court that is not an acquaintance of mine, but they absolutely shut their eyes to these facts. When a proposition is made at Cedar Falls or Waterloo to put exchanges in there, it is met with a combination of farmer or mutual exchanges, and notice is given the applicants that if they get a franchise they must serve the mutuals, and since exclusive rights are no longer obtainable, unless the mutuals are served they will go into the towns and obtain a charter and operate. Any proposition of a court which says that any telephone company can go on the public highway without the proper qualifications which will observe the rights of any and every citizen that may have a telephone, will be found in the near future to be overturned, and it seems to me that if you, in your state (and as far as we are concerned in Iowa, I pledge you that decision will be along the lines I speak of), will act there will be no doubt what the conclusion must be. If you insist on it at every turn, that a company which operates between states can operate in towns only with the consent of the towns and under the rules and regulations of the towns, you will soon get the Bell in a corner. I have raised that question and am having a contest in Canada with the Bell company as to whether or not, under the provincial law (by which exclusive rights were given), such rights would be good under the dominion law. Of course it is baby work to try that cause and admit that the Bell or any other company has a right to go upon the highway or in the towns and have exclusive or even continuing rights in the face of the constantly changing needs of the community. If you can conceive of any needs greater than these of the transmission of intelligence, I would be glad for you to show them to me. It seems to me that every man who is in earnest (and I have no doubt every man here is in earnest; you have to work hard and keep up against contention and opposition); should sit down on any proposition, and oppose any doctrine by which any part of the streets may be taken possession of against the common interests and the common good. I had not thought to say anything to this convention —I have a very deep interest in its Independent work, and I am fighting at every turn and making issues which will come to the surface pretty soon and enable us to know whether or not we can in our generation establish that principle which ought to be the stand of every man. If that is done, the establishing of the universal telephone must immediately follow. You can't switch, if you are on party lines, to a merchant in a town to any advantage. I was told of a case in Canada the other day, where a housewife was doing her sewing and sitting with the telephone at the back of her chair so that she might not miss any of the conversation going on between any of the other parties on the line.

What do the courts know about telephone business? In an open letter I have just written and published, I asked the congressmen from my state what they know about the history of telephony, about the telephone? I am insisting that our representatives and people who assume public responsibilities shall get knowledge enough to appreciate what has been done against odds, against combinations, against trickery and deceit, and crimes by the Bell company. I say to the gentleman from Kansas that in my opinion if you will allow some of your officers in Kansas to understand that you are going to demand that the occupation of your highways shall be in the interests of the people and shall be decided by the views of the people, you will not have a particle of difficulty. The Bell company knows to-day that there is exactly its danger. If it is decided that an interstate telegraph or railroad company has certain rights, and if, as a matter of policy, certain rights are admitted, you can say "We want our telephone in," and if they refuse it, you assert their obligations under the interstate commerce law, and you have a good case in the courts. Now, gentlemen, I beg your pardon for taking a moment of your time, but I am right in the fight and I think I understand the situation. (Applause.)

Mr. Thompson: In a very excellent paper that was read at the last convention, the question of highways and the occupation of public highways was very ably discussed with reference to our state and the other states in the Union. Ohio, under a law of the state, grants to magnetic telegraph companies, and afterwards by an amendment or by another section being made to apply to telephones, the right to use public highways, but following a well-established rule that gives us a right of eminent domain in the state of Ohio, for Ohio corporations, and eminent domain only means you can take and occupy private property provided you pay for the use of it, for the benefit of the public service. Eminent domain means that you have the right to occupy for public use certain property, but you must pay the persons who own it and have private rights to that property. And so in Ohio, I undertake to say it is well established that notwithstanding if that telephone company has the right to put telephone lines along the highway, yet they must settle with the persons who own the land abutting upon the highway, because the public has only the use of the land; they must settle with them and pay compensation for the use of their land, provided it is not donated to them. In cities, the state legislature has seen fit to grant to the city authorities the right to prescribe the methods and modes of the use of the streets of cities, and that is what is known as franchises in the cities and in the towns, and it provides in case they fail or refuse to agree the probate court may prescribe the methods by which a telephone or telegraph company may use the streets, alleys or lanes for public utility. It is rather a remarkable thing, and one who has given it some consideration, as has my friend, the last speaker, and others, question the advisability of allowing the probate court such liberty upon a question of such grave importance.

Now coming to the real question of the connection of telephone companies with mutual companies, the farmers are going to have telephones. There isn't an exchange manager in this house to-day who doesn't know that they are going to have more and more use for that service. They are laboring under the erroneous idea that the service can be furnished them very cheap. We know that to operate a country line, six or seven miles long, we cannot furnish that service at the price which they have an idea will be a fair consideration for the service. If an exchange manager has the right kind of directors in the neighborhood, it occurs to me that the proper thing to do is to take care of the erection of those lines and erect them in such a way that you can furnish them the best service for the least possible money, at the least possible expense. For that reason some years ago I inaugurated the idea of party lines and the exchange manager knows that we can't give single metallic lines in the country, five miles in length, for the price the farmers are willing to pay, and we have to furnish party lines. I adopted a method like this for my company, and this experience of mine might be of benefit to some of the gentlemen here. We had capital stock, and under our organization every owner of that stock had a vote in proportion to the shares he had. I arranged to issue preferred

stock on which our company agreed to pay six per cent interest, and in consideration for the guarantee upon our part to pay this interest the owner of that preferred stock was given the right to vote at the election of officers for our corporation. When the farmers came to me and wanted a party line into the country I said, "Gentlemen, it will cost so much money," and I convinced them just exactly what it would cost, and ordinarily they were surprised. I then gave them the proposition that we were selling stock of our company and would pay six per cent interest on it. I said, "You pay the established rate; subscribe for a sufficient amount of that stock to pay for the entire line," and I succeeded. The only trouble was that I didn't fix the rate high enough—the rate I charged for the telephone was not high enough. I said to them, "We will not put more than eight of you people on a party line. We will give you an instrument that will ring the exchange and give you good talking service," and I prescribed metallic service and prescribed the best possible construction at that time, with the view that those lines would be permanent. I have never been troubled in our territory with a mutual company—not one. The moment they began to talk "mutual company," I said to them, the "Valley Telephone Company will take your money, issue you stock upon which they guarantee you six per cent and furnish you service that you cannot afford to enter into the field in competition with, and if you want the service in your territory, let us build, and if you have doubts about the cost of the construction of this matter, we will submit our plan of construction to you and you can appoint a committee to investigate the bills for the construction, and you will know that every dollar of your money is being spent in the building of that line." I submit this for the benefit of all those present. It occurs to me it is an admirable solution of a problem, of a threatened mutual line—if there is mutual company—well, then I don't know what ought to be done. It occurs to me that a good business manager ought to arrange some way by which after these gentlemen who have tried it for a year or two and became convinced it was a losing investment, that they were suffering from depreciation, ought to be able to purchase the other lines reasonably cheap.

Mr. Barnhart (of Indiana): I am not a lawyer, and I am probably butting in at this moment, but I will ask for the double purpose of giving a brief bit of experience—I will ask Judge Taylor of Indiana to describe the new law which passed our legislature last winter in regard to the rights and privileges on highways by telephone companies. I think the Independent movement in Indiana is very well established. We have met the farmers' movement in my section of the country and we are taking care of it. We have built metallic service, putting on select signal lockout instruments that are giving excellent service, and we are charging $16 a year out as far as five miles. Beyond that we charge $18 a year up to eight miles, and beyond that point they must organize their own companies, and meet us the best they can. If they live more than eight miles from our town it is their misfortune and not our fault.

A Member: How many can you put on a line?

Mr. Barnhart: Twenty on a line. Each line will operate twenty instruments.

Mr. Thompson: What do you use?

Mr. Barnhart: I am not operating for any company, but if you will come and see me I will tell you. They like the lockout system so well that the farmers within eight miles of Rochester, with the party line service, are being constantly advised and reminded of the fact that they are paying for their service and pay the first year in advance for that service to a mutual company, nothing like the service they get from the Rochester company, at $16 a year, and I think we have the farmers' movement headed off for good. We say, "You can come in with your lines if you want to." I have said to them, "If you want to come in with your lines we will furnish the service of our switchboard at $3 a year each per telephone. We will not guarantee you satisfactory service because you cannot get it on your kind of construction, but if you want to come in on our lines we will give you the whole thing at $16 a year." Every man in that community who has a lockout telephone is a mighty champion for the Rochester Telephone Company, and every meeting he gets into where these cheap telephones are being used, we have in that fellow a standing champion for the Rochester Telephone Company and the kind of service he gets is as good as if he had individual wires.

Mr. Taylor: Some years ago a farmer came into my office and asked the question about rights on the public highway and I got down the statute—in the meantime I was asking him some questions to pass away the time, and he saw through me and said, "By golly, can't you tell that?" "Well," I said, "I don't know"—I had never read that statute at all.

Mr. Barnhart: I can state to you briefly, as a layman, what that law is—I helped it through. The Independent telephone interests of the state were notified one morning that a bill had been brought up in the legislature the afternoon before which had passed second reading, authorizing free use of all the highways of the state of Indiana, for the free use of telephone companies without any let or hindrance whatever, and the Independent fellows suddenly went to the capital and assured the leaders in the legislature that it was a Bell movement, that they wanted to drive us out, in many localities where the city councils had denied them the right of the use of the streets, because they had mistreated the people in general, and we got a law passed—I haven't read it myself since it passed, but I know they said it was all right—to the effect that we can construct telephone lines in towns and cities without the consent of the abutting property owner, but we must first get the consent of the boards of commissioners of public highways and must have the consent of the town council before we can use the streets and alleys, but we don't need the consent of owners of property along the highways. That is the sum and substance of it.

Mr. Taylor: I think that is right.

Secretary Coleman: Now I would suggest that the question of the farmers' mutuals was before the convention last year and the question of manufacturers working up mutual companies in competition with companies already in existence and working up competing companies in the same towns, was discussed and resolutions passed right along these lines. The secretary has heard complaint during the year and a number of times during the sitting of this convention that certain manufacturing concerns were still promoting, in order to sell their stuff to these competing companies where Independent companies already exist. I think the secret of the whole thing is the alleged manufacturing concerns selling manufactured articles to compete with companies already in existence.

Mr. Edwards (of Illinois): This question really brought me to this convention. I don't think the real point at issue has been fully touched upon. The paper read recommended the taking of lines of the farmers on to city and village exchanges rather than attempting to build and operate the lines by the exchange. I think the idea is wrong as advocated in the paper. It might do for a city to attempt to handle the business in that way, but for small towns or villages to handle it in that way is wrong. It would be only a question of a short time when the farmers' mutual would dictate to the exchanges as to whether they would have an exchange or not, and for that reason I would think it advisable for the exchanges to build the lines and furnish the instruments and lease them to the farmers rather than let us furnish them. I think that is one thing that exchange managers should think about.

President Hull: The next subject on the program is. "Where Should the Line of Demarcation Be Drawn Be-

tween Independent Operating and Manufacturing Companies, and the Bell Company?" by Hon. Henry A. Barnhart, of Rochester, Indiana.

Mr. Barnhart: Mr. Chairman and Gentlemen: In order that you may understand me fully, I want to announce that I am primarily a newspaper man; secondarily I am largely a telephone operator, and I say I am a newspaper man for the reason, while I would like to talk to you off-hand on the topic assigned me, I have been advised it is necessary to be very brief, and you all know how newspaper men scatter when they commence. Therefore, I shall confine myself to manuscript this morning:

Mr. Barnhart, President of the Rochester Telephone Company, Rochester, Indiana, then read the following paper:

WHERE SHOULD THE LINE OF DEMARCATION BE DRAWN BETWEEN INDEPENDENT OPERATING AND MANUFACTURING COMPANIES AND THE BELL?

A long time ago, so long probably that the participants in the incident are beyond the possibility of disputing it, a boy said to his father, "I am going to set the bad line of demarcation on my dog by cutting his tail off, to make him be good." "Then cut it off close to his ears," said the wise parent, "and you'll have him marked to stay."

We would not fix so harsh a line of demarcation to separate us from the Bell Telephone Company as its oligarchical characteristics. Instead we may, with propriety and perfect safety, permit it to go on in its present methods of slow suicide and then when its tactics prove fatal it can never be said that any of its life blood is on our hands.

The line of demarcation between the Independent and the Bell company is already fixed. It was arbitrarily established by the Bell company and I want to quote the Hon. Mark Hanna just far enough to say that we can well afford to "keep on letting well enough alone" by continuing to stand aloof from any compromise whatever with the Bell company, and to give the people the best and most popular telephone service at prices they know to be legitimate and fair. The public no longer tolerates telephone rate extortion, nor does it take kindly to the cut rate method which must sooner or later replenish its inadequate treasury by increased demands from its patrons.

In other years the Bell company not only refused the Independent interests recognition, but it tyrannically oppressed them by its wealth of influence, its power with legislative tribunals and its resort to ways that were dark and tricks that were shamefully more than cunning devices and shrewd manipulation. It hired great lawyers to intimidate Independent telephone capital by keeping it in hazard through persistent false claims of priority of patent and by the blighting annoyance of litigation on every conceivable pretext. It employed suave and resourceful agents to belittle, malign and cry down every step of Independent telephone endeavor, and these earned their salaries so well that Bell monopoly fed and fattened unmolested in many places where there was a universal public outcry for relief from the notoriously arbitrary and extortionate Bell business methods.

Notwithstanding all of this, Independent telephony has grown and prospered and pleased until there are increasing evidences that the Bell company is seeking compromise and good will from that which it sought to destroy by slander and intimidation. In my own state the Bell company not only seeks mutual business relations with Independent interests by the so called sub-lease plan of trying to check the growth of competition that looks overwhelming in its aspect, but at the last session of the legislature it sought to lengthen its lease of life by introducing a bill which, in substance, granted all telephone companies the right to construct equipment in any of the highways of the state without let or hindrance. But cunning as the move was, both in conception and purpose, it is hardly necessary to say that the Independent interests balked the high handed effort to revive waning Bell advantages and selfishness, and that the parchment on which the bill was written finally served the well merited purpose of cigar lighters for the state house janitors.

And yet with all this affront which the Bell company has been hurling as obstruction against the demand for the development of Independent telephone service, I am charitable enough to counsel evasion of fight unless absolutetly necessary in self defense or in clearing the way for the forward march. Fighting is oppressive on energy and destructive of force that could be turned to profit if judiciously directed. Besides it is a well established fact that the public will side with the right as soon as it is demonstrated, and fighting is a last resort in public sentiment of this city. When I was a boy I heard of a man who made thirty dollars in one year by minding his own business, and I have ever since observed that we gain little by stopping to indulge in strife and contention so long as the way is clear for us to move on in good intentions.

This promise, however, should not be misconstructed to mean that we surrender any rights or grant any favors to the domineering and belligerant Bell company. Indeed, successful promotion of our interests demands constant activity and alertness to foil the schemes of our once powerful and still resourceful rival. While the erstwhile Bell monopoly seems to be scourged and repudiated into a retreat, it may be like the story of the bravado who boasted that there were no such things as ghosts, and placed a wager that he could remain alone in a ghost haunted grave yard for two hours at midnight without fear of molestation. The test was given and he lost. Soon after reaching the scene of reputed phantoms he beheld a great white spectre arise and approach him and he precipitately fled. Over fences and across fields he sped like a shadow, but the ghost followed. Then he fell, face downward, exhausted. And as he lay terrorized and panting he glanced up to see if his pursuer had vanished when he beheld it hovering right over him, and it said, "We've been going some, haven't we?" "Yes," he replied, "and if I recover my wind and you keep after me, we'll go some more."

That fellow was like the Bell company, a boaster and a lion until dismayed, and then he flew and "played possum" and voluntarily promised to "go some more" if pursued further. We have the Bell company scared and on the run and it will "go some more" if we keep after it.

So much for the line of demarcation between Independent and Bell operating.

And what of manufacturing? Are we not already barred from the use of Bell made apparatus by the same line of demarcation that the Bell has established against mutual operating? We certainly are, so far as openly made Bell apparatus is concerned, and if there is Bell capital in so called Independent factories, this association should know it and protect its membership and Independent telephone interests generally from its imposition. We get neither patronage nor recognition of any kind from the arrogant Bell company, and we should not contribute strength to its substance by buying apparatus from manufacturers who sail under Independent colors and turn the profits over to the Bell treasury and corruption fund.

But over all and above all we must strengthen the line of demarcation established by the Bell company and recognized by the general public, which appreciates the superiority of Independent business principles. Locally we always get the business after a test of mechanical and operating efficiency in both extent and mechanism. For instance, a half million Independent telephones are in operation within a radious of two hundred miles of Chicago, all serving territory within the immediate commercial environment of Chicago, and, if I am not mistaken, not a single one of them can get connection with this most important business center.

Here is a condition of profound concern for both Chicago and the Independent telephone movement. Both have mighty interests in common and nothing but the monopolistic partition of Bell telephone greed separating them. Chicago business interests need the Independent telephone toll line connections, with their thousands upon thousands of contiguous business patrons, and they need an Independent local service to enable them to break down monopoly telephone rates to a basis of justice to patrons and yet of safety to investors. Likewise the Independent telephone interests need Chicago connections for their patrons as badly as Chicago business men need the profit and convenience of such a service, and the influence which keeps us out of Chicago is costing our business men millions of dollars in excessive rentals and trade losses every year, and this all goes to Bell telephone profits. In other cities, like Indianapolis, Louisville, Cleveland, etc., where the Independent telephone service has been admitted, business men and the masses have arisen to call the municipal authorities blessed. And a like crown of glory awaits the powers of Chicago who will invite Independent telephony to enter the Chicago field and demonstrate to its millions of progressive and deserving people the superior merit of the service and the mighty commercial advantages which its toll line connections would furnish. We want Chicago and Chicago needs us.

This is a line of demarcation between Independent and Bell service which should be obliterated, and we must do it. We have won the contest in a local way wherever we have given the people what they want. We have done this both through superior service and the good will of the public, which Bell company greed and intolerance have alienated. We can accomplish the same grand results in long distance service if we will, and it is a duty not only to self interests but to the public that we do so without delay.

But to accomplish this we must have a more binding union of mutual interests, one with another. We can not hope to cope with centralized Bell company advantages if we continue business on the ancient and loose jointed method of "every fellow for himself and the devil take the hindmost." We must not tolerate factional disturbances within our ranks, nor encourage the confiscation of Independent property by either buying supplies of opposition interests or selling supplies to opposition uprisings against established Independent interests. These are distinct lines of demarcation between our business ventures and fullest possible success which any intelligent man can readily distinguish.

Therefore if we will continue to let the Bell company maintain its line of demarcation between its avarice and public welfare and not permit it to "come over into Jordan" even if it so elects, as a means of self preservation, and if we will protect ourselves against imposition by lack of progress and of universal loyalty within our

own ranks, our business relations will become more agreeable, our incomes more adequate and our property more valuable.

If not this, what are we here for?

President Hull: The subject treated upon in this paper is open for discussion. Are there any remarks or suggestions? We would be glad to hear from any member present. The question is of vital interest, but you may all have it settled in your own minds. The next paper on the program is "What Should be the Representation in the Connection of the Interstate Independent Telephone Association in Voting?" by David Prewitt, of Winchester, Ky.

Mr. Prewitt then read the following paper:

What shall be the voting representation in the conventions of the Interstate Independent Telephone Association?

If this association had been organized solely as a social telephone club, it has been a great success, for it has introduced operators and manufacturers from all over the country and has furnished them a vast deal of pleasure and entertainment. If the only aim of the organizers of this association had been to make of it an educational society, they have reason to congratulate themselves, for through it telephone people have exchanged ideas that have left each the wiser. Even if this association had been merely a protege of the manufacturers—a sort of fall festival—whereby the operators might be brought to the city en masse more economically than they could be seen individually, I doubt not but results would justify their business acumen.

But if all these and these only were the objects of this association, a paper on "voting representation" were hardly worth discussing. Even if this association has powers that are advisory over its members, the question of representation is not a vital one. For it is bad enough to have had advisors, but not so bad after all, if the advice is not compulsory. But if this association ever has delegated to it by its members powers that are mandatory, the question of representation in its councils and conventions becomes one of paramount importance.

First, has the time arrived to delegate such powers to this association? If so, what ought to be the basis of voting representation in its councils and conventions?

In the infancy of Independent telephony your subscriber was contented with good service to the other subscribers on his exchange, and your interest in the success of your neighbor's exchange was purely sympathetic. Then your subscriber asked—at a fair toll rate (the telephone public is willing to pay) for connection with neighboring towns, and your interest in the exchange in those towns became actual. Now your subscriber is demanding connection with the nearest large city. To-morrow his demands will extend as far as the ingenuity of man will make his voice audible over wire, and your actual interest must keep pace with his demands. While on the one hand this education of the subscriber has made the telephone a necessity and increased its use until you have more business than you can do, on the other hand it has introduced into your business an additional hazard. You know that the success of your business depends in a large measure upon the action of those over whom you have no control. You are watching him and he is watching you—a condition which may result in panic. If every Independent operator could be assured that every other Independent operator and manufacturer would always maintain his integrity as an Independent operator or manufacturer, the Independent telephone problem would be reduced to a very simple proposition.

How best may this result be obtained? The first thought that suggests itself in this day of trusts and gigantic corporations is to consolidate all the Independent telephone interests in the country into one great telephone company. This was tried by the Bell company under conditions vastly more favorable than are the conditions that are around us to-day, and did not prove an unqualified success. The public tried it and was tried by it, and the public's demand for something better created Independent telephony. Consolidation would force some of the manufacturers out. The operators being as a class small investors, would find themselves only bondholders, or possibly employes of a business they formerly controlled.

The second way that suggests itself is that this result might be obtained by means of contracts between exchange operators and toll line operators. This is valuable, but not comprehensive enough. It doesn't bind the manufacturer. The operator generally has no notice of who have and who have not entered into agreement. There is the fear of collusion between companies so far removed that you do not know them personally. What is the solution?

More than a hundred years ago thirteen liberated colonies found themselves in the same predicament that we are in to-day. They had fought their battles and won them as we have. They had a common enemy as we have. They realized that an imminent common danger and that alone had kept them united. They knew that it was necessary to form themselves into an indissoluble whole by such ties as would bind them in times of peace as well as of war. They were unwilling to surrender more rights than were absolutely necessary. They knew that simple treaties between them were insufficient. A novel problem presented itself. They solved it by delegating to a central government only such powers as were necessary to a solution of the problem.

Why may we not follow their example? Divide the country into telephone districts. Disregard state lines, and taking the larger cities as centers, include the territory from a telephone standpoint tributary to them. In each district organize a district association. Let every Independent telephone company in that district become a member. Let each company send one representative who may on all questions as may come before the senate have a single vote, but on such questions as come before the house of representatives have a vote in proportion to the size of the company he represents. The questions upon which the delegate would have the single vote or the multiple vote would be determined in advance. Let the members of the district associations delegate to their associations the power to control the sale of voting stock, to make contracts with all telephone companies not members of this association, to settle all questions arising between members of the district association, and such other powers as may be expedient. Let every district association become a member of this association. Let each member send a delegate to this association, who may on certain predetermined questions have a single vote, while on other questions he shall have a vote commensurate with the aggregate size of the companies, members of the district association of which he is a delegate. Let every district association delegate to this association the power to ratify or annul the sale of any stock by one of its members or any contract it may make for any of its members with a company other than a member of a district association, together with the power to settle all questions that may arise between district associations or a member of one association with a member of another association, and any other powers that may be deemed expedient. Of course there is a vast amount of detail that would be worked out. I know this plan may seem novel, and it has its difficulties, but I do not believe they are insurmountable. If it can be put through it will prove an ideal arrangement. It is the great American idea. A management of the owner, by the owners, for the owners.

(In the absence of the president, Secretary Coleman presided.)

Secretary Coleman: Is there any discussion on the paper just read? If so, we will be glad to hear it. I would like to inquire if Mr. Bailey is present.

The secretary then announced the following as the committee on nominations: Rex, Indiana; Matthews, Kentucky; Bandy, Iowa; Friend, Illinois; Beffin, Missouri; Jones, Ohio.

Secretary Coleman: Mr. Bailey has now arrived and we will hear from him.

Mr. J. S. Bailey (Ohio):

Mr. Chairman and Gentlemen: I have no prepared or written address, but as I am fairly well posted on this particular subject, I will address you. It is a subject which is of importance, and one in which we are all more or less interested. The subject embraces two questions. First, the Independent telephone systems of the country and also the question as to whether or not the time is ripe at present to consolidate those systems. The Independent telephone system of the country, as it relates to toll lines especially, properly speaking long distance toll lines, has been established and constructed almost entirely during the past three or four years. Independent exchange systems have been constructed for the past ten years, and to-day we find in a large number of the states and in almost the entire territory of the United States, outside of New England, that almost every town has an Independent telephone system and that it is with difficulty that we construction men can now find places in which to keep our business going.

The exchange systems necessarily had to be developed first. The small towns were built before the larger towns. The Independent movement started in towns which had no systems. As the smaller towns were built up the larger cities came to be built. Small towns have not so much use for long distance service, and as a rule it is not absolutely necessary to the existence of an exchange system in a small town to have a long distance service. As a rule, toll service in small towns is local to the county in which that town is situated or with the adjoining county. In cities it is different. An Independent telephone company must have toll connections not only to the surrounding territory, but to the surrounding cities, and for years it has been a difficult matter to the large cities of the country in which Independent systems have been established to maintain and properly do their business and extend their systems on account of not having had sufficient long distance service.

During the past year, long distance service has been extended in a wonderful manner, and what is more, the long distance service in all the cities in which it has been built had greatly improved. From personal knowledge I know that the service in Ohio has improved more than 100 per cent during the past six months, and after all it is service that counts. The long distance systems to-day are generally confined to single states, a large city or a party interested controlling the large cities of the state having built the long

distance systems for that particular state or territory. In that manner Ohio, Indiana, Michigan, Kentucky and Missouri have to-day constructed long distance systems, and those systems have been constructed by exchanges representing the principal interests in those states. For instance the long distance system in Ohio was constructed and operated by the interest which controlled Cleveland and Columbus. The long distance system in Indiana was operated, controlled and constructed by the interest operating the Indianapolis exchange. The same was true in Kentucky; the same was largely true in Michigan, by the interest at Grand Rapids; the same is true of southern Illinois and eastern Missouri; by the St. Louis interests. The interests which I have named in those states have to-day a good long distance service in which those principal cities—some of the cities are connected and the connections between certain systems have been made during the past year. The Indiana system and the St. Louis system have been connected together by a through No. 8 copper circuit. from Indianapolis to St. Louis, and the service is absolutely perfect.

The Indiana system and the Kentucky system have been connected the past four months—two months before the Indiana system—and the service between Kentucky and Indiana is as good a long distance service as it is possible for any company to give. There are three circuits, Indianapolis, Louisville and St. Louis. We can talk to Louisville via. Indianapolis. While in St. Louis last year I called Louisville and had as satisfactory a long distance conversation as I ever had. Ohio and Indiana have made arrangements to connect their systems at Richmond, Indiana, and that connection will be made next year, probably early in the spring.

In the East, during the last year, great developments have been made in the long distance systems. Around Philadelphia complete system has been established. Harrisburg, Reading, and all towns in eastern Pennsylvania, and almost all the cities and towns in New Jersey have been connected with that system during the past year. In New York state there are two long distance companies operating, one covering the eastern territory and one covering the western territory around Buffalo. Buffalo already has the service to Rochester and a number of other western points. The Buffalo system and the United States system will be connected during the coming spring with through No. 8 circuits from Buffalo to Cleveland. For some time through circuits have been established between Cleveland and Pittsburg.

There is no question but what during the next year, probably by August first, practically all these systems which I have enumerated will be connected with traffic arrangements. In the West, there is at the present time a great development in long distance telephone work. The St. Louis company is building a through circuit from St. Louis to Joplin, which is in the extreme southwest portion of Missouri. The Kansas City company is building circuits from Kansas City to Joplin, and Kansas City to Sedalia, to connect with the St. Louis company. Kansas City to the north and also to the middle portion of Kansas will be connected during the coming spring.

Across the Indian territory the copper system has been constructed which will connect St. Louis and Kansas City systems at Joplin.

At Dennison, Texas, there is a system, and next spring that system will connect with the systems through Texas, giving service from St. Louis to Kansas City, Galveston, San Antonio, Austin and other towns in Texas.

From the general conditions which exist to-day and from the lines which have already been constructed, we can readily see that the time is near at hand when we will be able to talk not only 100 miles or 200 miles or 500 miles, but 3,000 and 4,000 miles, and so by the time this convention meets next year the Independent systems will have long distance service for as great a distance as the Bell company has to-day; in other words for as long a distance as it is possible to use the long distance service commercially.

We are all interested, more or less, here in Chicago, as the Automatic company is now successfully operating a large system in the business district. Without question, during next spring, that system will be connected with the other long distance systems. In addition to the Chicago systems and the other systems I have mentioned, there is a long distance system at St. Paul and Minneapolis, and that will also be connected with the Chicago system.

Practically all the telephone men represented in this convention, and especially the members of the Inter State Association, are probably more interested in Chicago than any other single point, as it is the center of the territory especially represented at this meeting, and I think that we will have Chicago and be able to converse through any of the systems in Kansas, Iowa, Minnesota, Illinois, Indiana, Kentucky, Ohio or Michigan to Chicago within the next year—that is a dream as well as a fact that only a few realize.

There is another important matter connected with this long distance system, and that is the financial part of it. The Independent telephone systems of this country have been built without the aid or assistance of any of the great big financial kings of our country. Wall street and LaSalle street and the other financial centers have looked down upon the telephone interest and have passed it off, thinking it amounted to practically nothing, but the time is coming when the question of consolidation of long distance telephone interests will do more than any other to attract attention to the financial importance of the Independent telephone interests of this country. The very fact that hundreds of millions of dollars will be invested in a few years in a certain business without the aid or assistance of any of the financial centers of this country is something that is wonderful in and of itself, and the financial centers to-day do not realize, and it is impossible for them to realize what has been accomplished. They know that there are certain local systems here and there, but they have never been brought to their attention. When the long distance systems of this country are consolidated into a company, and when financial interests come to understand that they can use Independent systems to talk from Chicago to Pittsburg, Buffalo, Philadelphia, Kansas City, St. Paul, Minneapolis and to secure prompt and satisfactory service, then will they realize that there is some stability and something to Independent securities, and when that time comes there will be no trouble about all Independent securities.

Independent telephone securities to-day, in the judgment of men who have followed them, represent a better form of investment than almost any of the other securities of a like nature, and to-day there are few securities which begin to represent their value, because for a number of years men have devoted time and attention to the building up of these properties, both local and long distance, and that value has not attached to those systems. To-day, take the street railroad systems which have been developed and attracted attention of the financial world. The physical value of the property may be a million dollars, yet the market value of the property may be several million. And it is so with the telephone interests to-day, except that we have not got the value on the systems which should be added to them on account of the work which has been put on to the systems in completing them, by establishing them and operating them and bringing them to the point where they are to-day, and that will come when the Independent telephone systems of this country are consolidated into one large company, giving satisfactory service.

Now the question is, is that time opportune to-day? Frankly, I do not think the time has as yet come for consolidating the Independent long distance telephone systems of the country. Before these systems can be successfully consolidated, each local, state long distance system must perfect its own organization, give a perfect system and thoroughly and distinctly establish its own business. Some three or four systems have accomplished this, but there are some ten or twelve others which must do it during the next year. In my judgment the time will not be ripe for at least one year and possibly two, but without hesitancy I predict that within two years from to-day there will be a long distance system in this country which will be the equal and in fact will be able to give superior and better service than the long distance Bell telephone system.

I know that in certain states and certain territories where the Independent system has already been developed, that the service is much better than the Bell long distance service. In the cities, we call the Bell long distance system great; you can talk from New York to Chicago. So you can, but because you get good long distance service over the Bell between certain points, is no sign that you do between all points. Between a great many points, in fact half the long distance of the Bell system the service is bad, and in three or four states, where the Independent systems have been developed, the service is good to all points, and when this consolidation of long distance systems does come, the service must and will be such that it will be good and satisfactory to all points in place of only a few.

First, before the systems can be consolidated, they must have traffic arrangements. Certain systems have consolidated in the way of making traffic arrangements for the interchange of business. It will take some of these systems a long time to get together, but they will get together eventually, and where any system holds out or contrives to take advantage over another system in a neighboring state, the Independent systems in those states should bring pressure to bear and see that these exchanges and traffic arrangements are made without delay. Certain systems, like the Ohio and Indiana systems, have been almost on the point of consolidating in the way of exchange arrangements for years, yet the systems have been forty or fifty miles apart with no service between. Telephone conventions and telephone exchange interests two or three years ago should have taken that particular matter up and seen to it that the Ohio and Indiana systems did make traffic arrangements and connect their two systems, because it is only by connecting the systems by traffic arrangements that you can bring about a feeling and a condition which will bring about this consolidation. I understand now that the Ohio and Indiana systems have gotten together, but if that is delayed I think the executive committee of the convention should take it up and try to have the exchanges bring pressure upon these two systems and see that they get together and make traffic arrangements, although I understand arrangements were made sometime ago.

There is just one other point to this question. We all hear a great deal about monopolists and about large companies. All of us who have been interested in Independent telephony have talked against these great big companies and against monopolies, but in all of our talks and in all of our arguments we have especially re-

ferred to the matter of exchange systems, because the only manner in which an exchange system local to smaller towns can be successfully operated and managed, is to have local people interested in it, and I do not think the time will ever come when all the local exchange systems of this country will be consolidated together, because if that time comes there will be no Independent telephone movement, and I do not think it is ever going to come. But the question of the long distance business is entirely separate and distinct. An exchange system covers certain limited territory and gives service to the entire territory, and it can only give that service successfully by reason of controlling and operating that entire territory.

Now the long distance system, in order to give successful service (it is impossible to do it if you go thirty miles over one line, switch forty miles to another line, go to another switching point to another line, or if there are five or six companies which must control these several lines), the only manner in which it can be done is for certain interests to control certain large territory and therefore it is necessary that we have large companies to carry out those projects. Our various Independent long distance companies already represent each one of them millions of dollars; some of them two or three millions, and the large company which will come will of course represent a great many millions, probably forty or fifty million dollars, and no small interest should be afraid of the effect of the consolidation of long distance systems when it comes, but we should all welcome it as it is the one thing which will add more to the value financially, and to the service of the Independent telephone interests in the United States than any other one thing. (Applause.)

Secretary Coleman: Gentlemen, we are now ready for the discussion of the address just made before the convention. Who wants to be heard? This is a question all of you certainly are interested in, and vitally so, and you can surely think of something of interest.

Mr. Wasson (Illinois): In central Illinois we have no long distance. It has not yet succeeded in getting in. The Interstate company is trying to get in from Springfield, where it has a new exchange installed, and within the next year we hope to be connected with Chicago and St. Louis. I think it is already connected with several trunk lines between Chicago and St. Louis.

Secretary Coleman: Any further discussion on the subject? If anybody wants to talk, we are ready to listen.

Mr. Brooks (Minnesota): I would like to introduce the following resolution, and if I can get a second to it I will state the reasons:

Resolved, that the president appoint a committee of three to investigate the action of the Postmaster General relative to his ordering Independent telephones taken out of postoffices. The committee shall report, as often as it deems proper, to the president of this association. The officers of the association and the committee are to devise whatever action, in their judgment, may be necessary.

Mr. Tetu (Kentucky): I second the adoption of the resolution.

Secretary Coleman: Gentlemen, the resolution has been read. Is there any discussion?

Mr. Brooks: The Twin City Telephone Company is operating an Independent company at St. Paul and Minneapolis, and in 1901 the postmaster at St. Paul requested the Twin City Company to establish a private exchange in the postoffice. We submitted to him the necessary figures and I presume he sent them to Washington, for our bid was accepted, and in January, 1902, the exchange was established, and ever since has been in successful operation, giving perfect satisfaction. Last summer, the postmaster in St. Paul received from the postoffice department at Washington, a communication in which it was stated that it was the judgment of the officials in Washington that no private exchange was necessary in the postoffice and asked how many Independent lines would be necessary in order to carry on the business, and also further inquired as to whether the service could be rendered by the Bell company, and for the postmaster to get the necessary figures and submit them to the officials at Washington. The postmaster replied that the present service was very satisfactory and in his judgment gave better service than a number of Independent lines would give, owing to the distance of the different departments from each other. In October, the postmaster at St. Paul received from the department at Washington a letter which read about as follows:

It has been decided that the postoffices throughout the country shall have one telephone system. In order to make it as uniform as possible, that that system must be the one which furnishes long distance service throughout the country, and particularly with Washington, as we desire to be able to communicate with the different offices if necessary. You are therefore directed to have installed in your building at once the telephone system giving the long distance service referred to. You will please secure the rates for this service and forward them to Washington, itemizing the list of telephones required and the prices for the telephones.

We obtained from our representative in congress and the senator from our city, letters of introduction to the Postmaster General, and sent our manager to Washington, and he interviewed Mr. Payne in regard to this matter. He has given us in a letter as near as he could, the conversation that he had with Mr. Payne. Mr. Payne told him in practically these words what he thought about the matter:

This is all very well, but the letters do not touch the main point, namely, "long distance lines to Washington," and therefore I cannot consider the matter. You have no out of town service, at least you have no service at Washington. This is not a political matter at all, and it will do your company no good to bring any political influence to bear. This order has been issued for the benefit of the department only, and if my dictating to our St. Paul office makes trouble for your company it cannot be helped. Nothing you can do and no pressure you can bring to bear will change the matter in the least. The telephones are not for the benefit of the public; therefore they are not taken into consideration. I do not know, neither do I care, whether your company has more or less telephones in the Twin Cities than the other company. I do know it has no long distance connection with Washington. Therefore we cannot use it. The telephones are for the use of the postoffice department in communicating from one department to another and the various substations, depots, etc. We desire to have this service uniform throughout the country. There is but one company at present giving this service, and it is the one that has the long distance lines coming into Washington. Therefore we have decided to use in the postoffices only the one service.

This question came up with another private or Independent company situated in a state not far from here, and a representative of that company visited Washington, and the Postmaster General told the representative of that company that the order had been issued by the First Assistant Postmaster General, and I believe some understanding was arrived at, by means of which the Independent service in that postoffice was not interfered with. Our representative in his conversation with Mr. Payne was told that he (Mr. Payne) was solely responsible for the issuing of that order, and he would see that it was carried out.

Now, while cities of perhaps fifty and one hundred thousand inhabitants at present only are affected by this order, it is going to come sooner or later to all towns throughout the United States wherein Independent telephones are being operated, and it is a matter that should receive, I think, our serious consideration, and some action should be taken in order to prevent this order of the Postmaster General going into effect.

Mr. Presson (Iowa): The subject this gentleman has brought up hits us squarely in the face. I happen to know that Mr. Payne was the former president of the Wisconsin Telephone Company, the licensee of the Bell, and he holds large interests in the Bell company's property, and it is plain why this order comes from Mr. Payne. The statement he makes that it is not a public convenience is erroneous, because it is altogether a public convenience. While they may have a public exchange in the postoffices in towns like Minneapolis and St. Paul, and it is used largely at the departments, at the same time they issue the order not to allow any Independent telephones at the postoffice, which hits us pretty hard. Whether an Independent telephone is of any value to people in Iowa City, you can judge for yourselves. We have 850 telephones and the Bell has nine. The postmaster put our telephone in his postoffice and used it for a year and a half and he applied to the postoffice at Washington to defray the expense and they wouldn't do it, so he paid it himself. He got an order about a month ago not to

allow the Independent telephone in the office under any circumstances. I would be very heartily in favor of the association taking the matter up with the department at Washington. It is very plain that the department is biased, notwithstanding it doesn't cost the government anything.

Mr. Rogers (Iowa): Up to the time the Bell company recognized the fact that it would have to depend for even apparent supremacy on the long-distance business, it was all the time talking about the disadvantage of having government relations with local companies. That condition of the Bell company has been absolute in Iowa City for years, and also in other towns in the state. Yet we have a representative of the party for which Iowa gives 30,000, 660,000 to 80,000 majority, coming in there and ordering Independent telephones out of government offices. Think of it! The Postmaster General of the United States doing the business under the plea of the business of the country for the Bell company, because he holds some of its stock. (Applause.) We have already served notice on the gentlemen, not only personally, but through the influence of the people of my state, and I insist that there shall not be a representative of the people from Iowa who will not take our position on this point. At Minneapolis that order has been suspended for a few days, solely because they begin to feel the pulse of the people on the question, and I think that Henry C. Payne will learn from the humblest citizen, black or white, or from Honolulu, that he cannot serve the Bell company behind the mask of a representative of the people of the United States. We can reach the officials down in Washington, and I have made a declaration that has reached the ears of my friends in Congress from Iowa, that this question is going to be fought to a finish. It is not enough for them to say they didn't know about it; they have got to learn about it, and not sit supinely in their seats when the Postmaster General of the United States strikes at the interests of the Minneapolis company which has done so much for the interests of the people of that city.

Mr. Tetu: Mr. Chairman, I have had this postoffice matter on my hands and I went to Washington because of the failure of the department to recognize a recommendation sent in by the postmaster at Louisville promising his support and desire to retain the service of the Independent company. I went to Mr. Payne under very favorable auspices. After first approaching the subject and referring to the recommendation of the postmaster. Postmaster General Payne sarcastically remarked, "Oh well, I suppose this representation was brought about because the postmaster there is a stockholder in your company." I said, "Mr. Payne, I am not in a position to say whether he is or not. I do know if he is, he has as much authority to be a stockholder in our company as you have to be a stockholder in the Wisconsin Bell Telephone Company." I said further, "I propose to take this matter before the President. I will get it there some way or other, and I want him to consider the fact that the investors in the Independent telephone enterprises consist of farmers and capitalists and not capitalists alone." He tried to lay the blame on Assistant Postmaster General Wynne and apologized for his absence in St. Louis at the time, and promised immediately upon his return to Washington to take the matter up. He did. He sent a post-office inspector to Louisville, who reported on the situation, and we have our telephones in there to-day, and they are being paid for. How long they will remain I don't know, but I think we should lose no time in having a proper representation go to the President and lay some of the facts before him.

Mr. Hall (Pittsburg): I have been much interested in the discussion concerning the Independent systems. In Pittsburg we have the most intense competition. The Bell company has spent between $1,000,000 and $2,000,000 in our vicinity this year, and I think the question should be brought up in regard to long-distance service at Washington, and that the representation regarding the Twin Cities should be brought to the attention of the President, and I think it might result in the removal of Henry C. Payne.

Mr. Brooks: The plea given by the Postmaster General for the introduction of this order for the Bell telephone throughout all exchanges is for connections with Washington. The department is very penurious in its operations with reference to the post-master at St. Paul and Minneapolis, on the occasion when they wish to consult with one another, where they have to pay the telephone fee of ten cents per message out of their own pockets. There is a very good Independent telephone company in operation at La Crosse, Wisconsin, that is being successfully conducted, and it is only a matter of a few months before it will have long distance connection with St. Paul and Minneapolis. Since this convention assembled, we learn that the Postmaster General has ordered Independent telephones taken out of the post-office at La Crosse, and so it will go on throughout the United States.

Mr. Rogers: I move as an amendment to the resolution now before you that the result of the action of the committee appointed under the resolution shall be in terms that seem best and most expedient to them, and that it be sent direct to President Roosevelt.

Mr. Presson: The Bell company has been in Iowa City fourteen years, and the post-office department never had a telephone there until we got ours in.

President Hull: The resolution is amended. Any further remarks on the resolution as amended? I will appoint on that committee Mr. Tetu of Kentucky, Brooks of Minneapolis, Thompson of Ohio.

Mr. Gary: I move that each member of this association write his congressman from his district and call his attention to this matter.

Motion seconded and carried.

The president put the motion on the resolution as amended, and same was unanimously adopted.

Mr. Rogers: I suggest that copies of the resolution be printed so that the members may have it to forward to their congressmen.

President Hull: The secretary desires me to make the announcement that the printed copies will be provided. The next paper is, "Are Our Telephone Periodicals Sufficiently Careful as to the Business Relations Sustained by Contributors?" by W. H. McDonough, New York.

Mr. McDonough then read the following paper:

Mr. Chairman and Gentlemen: Some years ago we had in New York a brewer named Sweeney. Mr. Sweeney is now dead and in heaven where in due course I hope to meet him and renew a most delightful acquaintance. By the plentiful use of corn meal instead of malt and hops and by the judicious planting of saloons where they would do the most good of a Saturday night, in separating the workman from his wages, Sweeney came into a fine peace of mind and a fortune of $1,000,000, most of which I am sorry to say he had to leave behind when he passed into the Celestial state. Some years before his death Sweeney developed a considerable talent as an orator, a talent which he put to happy use in the cause of Tammany Hall during election times to "insure the endurance" as he put it, of a form of government by the people that did not interfere with the holy right of the citizen to spend his wage for good beer instead of wasting it upon the backs of his wife and children in buying clothes that they might very well do without and no harm done. Imagine my amazement then when I came upon Sweeney one Sunday afternoon addressing the small boys' section at the Orphan Asylum, which he helped to support, on the subject of temperance. With all the fervor of his Hibernian tongue he exhorted them to avoid liquor as they would the devil. By the time he finished I had so far recovered from my surprise that I was able to demand an explanation. "Sure I'm doing penance," Mr. Sweeney told me with a serious face. "Father Doyle put it on me. 'Sweeney,' he said, 'go out,' he said, 'and preach agin the curse ye've done so much to spread.'"

"Fortunate," Sweeney went on in confidence, "he didn't say where I was to go preaching, so over here I come where it'll do the business no harm. Sure the lads there will not be big enough to drink, even if they wanted to, until long after I'm dead and gone."

I am afraid that my case is something like Sweeney's, that the task of preaching against the sins of that branch of the telephone industry which I have the honor to represent, has been put upon

me as a penance. Fortunately I can do so without a violation of conscience as my period of sinning is long since passed and, as in the first instance, the guilt arose, as I will tell you later, not through wilful practice but through a mistake which I was happily in a position to remedy immediately. Since then, like all converts, I have been most zealous for reform and it was undoubtedly for this reason that I was selected rather than some of my editorial brethren to tell you whether or not our telephone periodicals are sufficiently careful as to business relations sustained by contributors. To make the subject entirely clear I think I should first read to you the correspondence that passed between your secretary and myself.

Under date of "Louisville, October 19th," Mr. Coleman wrote me as follows: "Dear Sir: You have been selected and are requested to prepare a paper for the next convention of the Interstate Independent Telephone Association which will meet at the Auditorium Hotel, Chicago, December 8, 9 and 10, on the subject, 'Are our telephone periodicals sufficiently careful as to business relations sustained by contributors.' Kindly notify the secretary at once of your acceptance and oblige."

The subject as set down rather puzzled me and I wrote to Mr. Coleman asking that he show me just a little more clearly what it was the association wanted. In response to this the secretary wrote under date of November 16th, saying:

"I beg to state that the specific object of the next convention will be to eliminate everything tainted with the Bell interests. In other words, the convention will endeavor to draw a line of demarcation so that there may be a distinction between the Independent companies and Bell companies both as to manufacturing and operating interests, and so we have decided to extend it to our publications. You will remember the DeLand communications to a certain telephone periodical and have noticed others. What we want to know is, when the operator reads a contribution, or an article in any electrical or telephone magazine, journal or periodical, that it is from a man and prepared by a man who is an Independent man in reality, and hence the obligations the editors of these periodicals are under."

To further make clear just what was wanted another member of the association sent me a clipping from the Mansfield (Ohio) *Shield*, of November 10, 1903, in which the following article was reproduced under sensational headlines:

TELEFHONE FACTS TAKEN FROM NOVEMBER ISSUE OF ———— AN ANTI-BELL PAPER.

(I am reading this verbatim.) It shows the standing of various Independent telephone exchanges in Ohio for the month of August, 1903. It seems evident that no allowance whatever was made for the all-important "sinking fund" for taking care of the depreciation, emergencies, etc.

Columbia County Telephone Company shows a deficit of $146.15.
Citizens' Telephone and Messenger Company, Fostoria, shows a surplus of $81.49.
Mansfield Telephone Company shows a surplus of $10.18.
Massillon Telephone Company shows a deficit of $9.49.
Stark County Telephone Company shows a surplus of $114.95.
Wood County Telephone Company shows a deficit of $126.44.

Should any of the exchanges above mentioned suffer from severe storm or other disturbances to which all telephone plants are susceptible, or when their telephones begin generally to pack and give out, as some makes do after being in service for two or three years, how is this question of extra expense going to be taken care of?

Remember another thing—that a plant, during the first year or two of its operation, will not show up its weak points as rapidly as in the third and fourth year. Should you desire, however, to "take the bull by the horns" and invest, please remember this last remark. Respectfully, A. L. IRISH.

This has the mark "1t" showing that it is a one-time paid advertisement, paid for by the local Bell company.

As we, in our paper, have been fighting just this sort of Bell work for a long time, I naturally accepted the committee's invitation to make an address along lines that might bring a reform in the promulgation of matter that lends itself to the uses of the Bell company. At the outset, I will say very frankly that the editors of our publications are not in many cases sufficiently careful in ascertaining the business connections and other affiliations of those who offer contributions to their columns. Conditions prevail in the Independent telephone industry which prevail nowhere else. And because of these conditions the editors of the telephone papers are, or should be, required to consider questions that do not obtrude themselves in the journalism of any other trade or profession. The Bell people employ such invidious methods in their effort to stifle competition that those of us who are engaged in the industry, and depend upon its success for prosperity, can hardly do the most commonplace thing without subjecting our action to the closest scrutiny in order to ascertain whether or not we are playing into the hands of the enemy. This, in many respects, is an unfortunate condition, as it undoubtedly hampers the development of the telephonic art. But there it is and the responsibility to meet this condition is squarely up to every man who is in any way connected with the industry. He who fails to meet this responsibility, and through such failure jeopardizes his interests or the interests of others in the business, is guilty of a grave fault for which he should be held to a strict accountability. It is a peculiarity of the Independent telephone business that more than in any other industry the injury of one is the concern of all. You cannot damage the smallest operator or the smallest stockholder without doing grave damage directly or indirectly to everyone who has money invested in the Independent field. This is due not to the fact of an interwoven relationship of the eight or ten thousand concerns that are connected near or remote with the Independent business, but to the fact that the Bell company has spies and agents everywhere whose main business is to pick up information, in print or otherwise, that may be paraded in the newspapers of the country to the detriment of the industry in general, and for the purpose of scaring off local capital on which the Independent depends. The Bell has conducted a press campaign that for thoroughness and ingenuity and unscrupulousness has probably never been exceeded in this country. The editors of the telephone papers more than any other class of men in the business know, or ought to know this, and consequently they, more than any other, should be on their guard against uttering in their columns anything that may be used to the hurt of the cause by the Bell press bureau. The editors, more than any others, are in a position to appreciate the grave menace that lies in the use or misuse of the public press by the agents of the Bell company. The Bell exchange and clipping service bears eloquent testimony to this every day. In our office we receive anywhere from a dozen to a hundred such items as that which I read before. In view of this it is not difficult to measure up the blame that lies on the shoulders of any editor who does not scrutinize the matter submitted to him with the greatest care, and who does not refuse resolutely to give publicity in his reading columns to anything that may react to the detriment of the industry. If competition was honest and open, if unfair methods were not the rule with the Bell people; if the telephone industry stood before the people as does the electric lighting industry or the street car industry or gas industry, or any other of our great industrial subdivisions, no great harm could result from anything that might be published reflecting on the methods and manners of the Independents. But where everyone knows that even the most innocent criticism is spread throughout the country to be paraded before the layman as one of many reasons why the Independents cannot succeed, there is put on us a degree of restraint to which we should all bow.

As I have said before, in our office we have on some occasions been caught napping, but I am happy to state that since the Bell press methods have been laid bare, we have had nothing that could be distorted even by the most astute Bell manipulators into material for a press campaign. About the narrowest escape we had was in the case of a man whose actions in this line have since become notorious. When the American Telephone Journal first appeared in its present form, this astute gentleman put himself into touch with us and prepared for us a series of articles bearing on the telephone situation as he professed to see it. At that time his position in the Independent field and his reputation was just being suspected. But writers on telephony were few and far between and he made the most of this situation and secured admission to our columns. Fortunately for us, and we believe for the Independent cause, the true character of this man and his true and harmful relation to the Independent industry was made manifest shortly after the publication of his first article, and we promptly returned to him the balance of the series, five in all. Two of the five articles had already been put in type, but the proofs were returned to their author with the manuscript and the type was destroyed. We hoped that this would be the end of this person in print, so far as the Independent press was concerned.

It was with serious apprehension therefore, that I saw another series by the same author, produced a few months afterward in one of our monthly publications. These articles appeared at a time when we were making a particularly bitter fight on the Bell press methods and when we had rejected at least a dozen contributions through suspected sources. Ordinarily, on the appearance of this series we should have been unsparing in our denunciation of the author and the vehicle which gave him publicity. There was a question, however, of policy in this case which bound us to silence. We deemed it inexpedient to make an attack upon this paper which might be misused for the very purposes and in the very manner that the Bell was misusing the other statement appearing from time to time in the telephone press. For this reason we maintained our silence for several months until at last, action was forced on us by the receipt of a number of letters bearing on these contributions and insisting that it was our duty to expose the true character of these articles and of their author.

As a result of these letters and the others sent in, we proceeded to do the only thing that was under the circumstances possible. We gave the author the benefit of an editorial that we believe had the result of shutting off any further effusions from his pen, at least over his own signature. Unfortunately it has been impossible to prevent entirely, the publication of his articles and they have continued to appear steadily in various forms, though always anonymously.

A fair example of the pernicious stuff put out anonymously in this manner may be found in the following extract:

The average investment per subscriber in six Bell plants is $214.37, while the average gross earnings per subscriber on that investment are $54.86, or an average gross return of 26 per cent on that invest-

ment. Now the same number of Independent companies report an average gross earning per subscriber of $307.04, with a reported average gross earning per subscriber of $24.72, or an average gross return of only 8 per cent on the investment. The other Independent companies report an average investment per subscriber of only $174.37, but the gross earnings per subscriber are only $15.10, or an annual average gross return on the investment of 9 per cent.

That is, on an average investment 43 per cent less than the six Independents claim, the Bell derives an average income per subscriber 102 per cent greater, and on an average investment 23 per cent greater than that reported by the ten Independent companies the Bell derives an income 263 per cent greater. This shows why the Bell is able to "include deferred or contingent maintenance and fund to cover depreciation and eventual reconstruction" in gross earnings, and also why the Independents fail to include it.

What must be the result of such a publication? Of course every practical man in the telephone business knows that these figures put forward in such an ingenuous and serious manner, are manipulated in the most dishonest fashion, that they are deliberately garbled to suit the purposes of the writer and that they misrepresent entirely the true condition in the telephone field. But it should be borne in mind that matter of this kind is not meant for consumption by practical telephone men. It is cooked up in an expert way in order that it may later be dished up through the lay press to frighten off prospective investors in Independent securities. It is this phase of the question raised by your committee that is really and gravely serious. I doubt that you can appreciate that as much out here as the Eastern Independents appreciate it on their own ground. There capital is much more timid than in the more energetic West, and the spirit of the pioneer is not as hardy and as daring. When in addition to his other troubles, the promoter of a new Independent telephone plant is forced to meet such statements extracted from the columns of the very papers upon which he should be able to rely for support, he came face to face with a very pressing problem that should have your best attention.

I have spoken at some length particularly of this particular series of articles, because the author, through his unflagging energy, has kept himself and his writings, signed and anonymous, more persistently before us than almost any other man, but of late he has met a rival, or as some say, an associate, whose success in spreading pernicious and false doctrine promises to be even greater, thanks to editorial indulgence. I mean the writings we have all seen recently of a man whose statements suggest nothing so much as the inspired utterances of that remarkable Prophet of Zion City, Elijah Dowie. Zion's prophet has held us all breathless with a promise of great spiritual force that shall translate us all bodily to the glories of Paradise if we have but faith. This telephone prophet comes along with a dynamic force which is to translate us, if we have but faith, to a telephonic paradise where the subscriber gets his service for nothing and the capitalist gets eight per cent on his investment. And these writings would have as much weight with the people generally as the utterances of Dowie have, were it not for the fact that he is given unlimited space to vent his impossible figures and theories in a publication that will be paraded by the Bell people, and very properly, as a representative journal. The Independent telephone companies of Baltimore and Des Moines are just at present engaged in an effort to secure permission of the authorities to raise their rates. Baltimore desires to install a measured service which shall result in giving it an average revenue of something like $50.00 per station. Des Moines also asks a fair increase. Both these companies, like scores of others throughout the country, like Cleveland, Pittsburg, Toledo, etc., base their plea for higher rates on the statement that at the present rates they are unable to provide for interest, sinking fund, maintenance and operation, because the services in these cities have far outgrown anything deemed possible by the men who secured the original franchise and made rates on a low revenue basis. What will be the answer to these applications for increased rates when this telephone prophet is permitted to state in the columns of one of your telephone papers that he can give unlimited service in Baltimore, Des Moines and other cities, large or small, regardless of the number of subscribers, at $10.00 and $15.00 per year; that he can build on the *same basis*, the extreme capitalization per station being, according to his figures, $61.00, with capital assured 8 per cent at these rates and the cities guaranteed all underground construction, not a pole to be used in the entire plant? When such matter is put out seriously as a leading article in one of your papers, I think you are entitled to ask the question propounded by your committee—"Are our Telephone Periodicals Sufficiently Careful as to Business Relations Sustained by Contributors?"

In fact, I should say that you are entitled to ask a great deal more. Yes, I should say that you *ought* to ask a great deal more. I should say that all of you have been shockingly remiss in your plain duty in not asking more. You have stood calmly by and have seen matter of this kind go out issue after issue, month after month, without the slightest sign of protest. I don't think that in taking this calm, not to say supine attitude, you have been doing your duty either to your stockholders or yourselves. As a newspaper man, and as a good citizen I am naturally in favor of the untrammeled liberty of the press, but as a conservative telephone man, as a conscientious editor, I think there ought to be a very sharp line drawn between liberty and license, between legitimate discussion and crazy theorizing between serious trade literature and the promulgation of figures that may get every Independent telephone operator in the country into trouble, if it is spread before the lay public.

What answer are you going to make to your subscribers if the absurd and insane estimates of the man I have quoted, fall into their hands, used as the leading article of one of your telephone journals? It is here where the great mischief lies with those of your editors who spread such doctrine in their columns. What your remedy shall be you must decide for yourselves.

I have no plan to suggest, no course of action to advise; but I have this to say, and I beg that you take me very seriously: The standing and prosperity of a trade is measured to the outsider absolutely by the character of its literature. You are written down and judged according to the portrait painted of you and your doings in your trade paper. The cloud cast upon the Independent industry by the unfortunate sale of the Kellogg company to the Bell interests is a dark one, but after all it is only a cloud and will be lifted; much graver is the injury visited on the industry by such misstatement as I have quoted and which, repeated again and again, ultimately inflicts damage beside which the damage inflicted by the Kellogg matter is puny. You should take steps as a matter of self-protection, to put an end at once to the further promulgation of such matter in the papers that you support and that without your support cannot live.

Mr. Rogers: Gentlemen, I am the individual that Mr. McDonough alludes to as being insane, as being crazy, as being wicked, and he appeals to you with all the appearance of energy and haggardness of a man who has slept over a whole day from the time his paper should have been delivered against me to this convention. I am not asking any of you to pay one dollar to us on account of the cost of advertising in the journal he refers to; any man of you can go and see whether or not he can buy the goods, buy the cable of the Standard Underground Cable Company of New York for the prices named. In the October number of the journal he quotes from, was the letter I wrote to the manager of that company asking whether he would furnish goods at the prices named; *and these prices were named upon the survey of the town for which the account was made.* It has been of interest to me, whether it would be possible for Mr. McDonough to influence anyone's opinion as to the accounts he has attacked, or to go to the Independents who have borne the burden of the fight against the Bell company and prejudice them against a standard proven account. But I am not in the habit of bringing up personal matters. Mr. McDonough in reading that paper was afflicted with the feeling that he was doing a public service to make this attack. It affects me nothing, because in spite of all the gentleman has said and knowing what the attitude is of people who are oppressed with great public duties and responsibilities, and yet not furnished with ability to carry them out, I chose to make these publications of these accounts for the benefit of the people and directly to the people; and I am going to continue in that very journal next year accounts for other states. There are some representative people (not insane) in those states who have already formed an association with me for meeting (when it comes to their state) this attack now made upon our attempt to furnish the people of Iowa a standard telephone system in that state. It is not a personal matter with me whether you wish to pay $30 or $18 for your telephones. We prefer to put our money in the automatic; others may do as they please. No manufacturer can open his mouth against that account. I laid that trap for just such gentlemen as the editor of the American Telephone Journal, and some engineers and constructors declared that, at this convention, there would be an attack upon that account. I don't think it lies in the mouth of Mr. McDonough, or any other living man, to try to influence the manufacturers of this country against my proposition in Iowa. I can assure the gentleman there are plenty of people in Iowa who do not regard me as crazy and who do not regard me as unable to defend myself when it comes to a personal matter, or against the extreme and beautiful exhibition of nerve of Mr. McDonough to ask this convention to combine and take action against me. When the frost is out of the ground there will be put in a cable from West Union to Clermont carrying pairs for every farmer along the

line. The Independent system is not well operated through any of those towns. I went into a livery stable in my native city and I couldn't get a message over the Independent system. The Bell is putting through their great big fine poles and metallic circuit, and is going to claim that the same condition exists throughout the state of Iowa and that the Independent interests have gone down.

President Hull: I would like to ask the gentleman whether he is advertising the Bell company or himself here?

Mr. Rogers: I am not advertising the Bell company.

President Hull: You are running down the Independent telephone interests in Iowa.

Mr. Rogers: It is my money and my property that is going in there to bring that Independent company out of its difficulty, and I have made arrangements with a banker in my native town to meet that Independent company and relieve its situation of apparent bankruptcy to-day, that it might accept any advantages that might be brought in on account of this movement. I went before the Northeastern association out there at Cedar Rapids expecting to meet the issue, and I gave fair warning to that Independent company what I would do, and now I am doing it, and we are going to settle up with these Independent people and show them how we think they ought to be met when they are in trouble. Now, the gentleman has made this attack, but whatever you may think, or say, I pledge you as soon as the frost is out of the ground there will be a specimen of supply service at a price which will enable every one of you Independents to meet the farmers' interests and the mutuals' interests without any further controversy at all.

Mr. McMeal: Mr. President, I should like to make a statement.

President Hull: You may do so.

Mr. McMeal: Mr. McDonough, in his paper, was not fair enough to mention the publication he attacked. I wish to state to this convention that it was TELEPHONY, of which I am the editor. No man can say that TELEPHONY is anything but an Independent publication, nor that it is not fair and fearless. Neither is it subsidized, and it certainly is not edited by Herbert Laws Webb, the Bell engineer, as is Mr. McDonough's American Telephone Journal.

Secretary Coleman: It has been suggested that a press committee be appointed by this convention whose duty it shall be to take care of our noble and gracious friend the American Bell Telephone Company in its publication of lies all over this country. They never publish a truth, and I think it is imperative that you get some men with ginger on this committee that will "shoot it into them" good and strong. I move that a committee of three be appointed whose duty it shall be to attend to the Bell Telephone Company through the press of this country.

Motion seconded and carried.

President Hull: I will appoint our secretary chairman of the press committee, also Mr. Barnhart of Indiana and Mr. Heseltine of Ohio. There are also other committees to be named:

Express—Bandy, Iowa; Thorn, Iowa; Hall, Pittsburg.

Freight Rates—Theodore Gary, Macon, Missouri; David Prewitt, Kentucky, and J. S. Bailey of Ohio.

To consult railroad companies—Buffan, Missouri; Herr, Iowa; Prewitt, Kentucky.

Mr. Stanton (Ohio): I have been informed that every patent taken up at the patent office has been known by the Bell company and if they can start any litigation or lawsuit in regard to a patent they can get out an injunction and stop anyone from using that patent. I thought probably someone in the association knew something of it.

Mr. Taylor (Indiana): It is ten years since I began my fight against the Bell company's Berliner patent, and it ended successfully just ten years afterward by the judgment of the United States Circuit Court of Appeals of Boston, by which the Berliner patent was put out of the running. I don't know of any such movement suggested by the gentleman. It would be impossible. All litigants in patent cases have been subject to long established rules, and I think I can say with certainty that the Bell company can get no injunction on any patent now extant that will hurt anybody. I think the Independent telephone companies are absolutely safe from any interference by injunction for a good while to come, and I might say forever. The patent that was most threatening to the Independent people was the Berliner patent. That has gone to its final rest. The patent next most threatening was the one known as the Carty patent, which covered the devices known and used on party lines. A victory for the Bell company on that patent would have been a very great disaster to the Independent movement. Would have compelled the abandonment of the movement. And it would have compelled the abandonment of the central energy or battery, for which no equivalent exists except the introduction of a third wire. That case was tried in Pittsburg and the patent was found to be invalid. An appeal was taken at the United States Court of Appeals at Philadelphia. The decision has not yet been announced. There is only one other point involved in telephone construction of importance, and that is commonly known as the center battery system, the use of a single battery at the central station to operate the line. That system has become very popular and is pretty nearly indispensable to Independent companies. To dispense with those features it is necessary to have the central battery at the central station. There are two suits pending upon five patents by the Bell company which relate to the central energy system. Those suits have made some progress but are not settled. I predicted at Detroit some years ago that the Berliner patent would never do anybody any harm, that it would die, and I now say I do not entertain any serious fear of the five patents which cover the central energy system, and I am not in fear of any patents which threaten interference with the Independent system. The patents of the Bell company are dying off by the lapse of time. There never will cease to be, I suppose for a lifetime, improvements in telephone systems, in transmitters and receivers, and more particularly in switchboard arrangements which will add to the convenience and economy of operation, and in the patent field it seems to indicate that litigation in the future, instead of being almost entirely by the Bell company against Independent companies, will be scattered around and will be as much between Independent companies themselves as between the Bell company and the Independent companies. Every company is trying to improve its system, reaching out for such inventions and devices as will give it something to talk about? It is going to be a free fight in the patent courts more than it has been. I think I can say, in answer to the gentleman, that there isn't any ground for fear along the lines that he suggests.

President Hull: We will next have the report of the nominating committee.

Mr. O. Rex, chairman of the nominating committee, then read the report of said committee as follows: "We, your nominating committee, recommend the following members to be elected to the respective offices:

President—Hon. Henry A. Barnhart, Rochester, Ind.

Vice-President—E. H. Moulton, Minneapolis, Minn.

Secretary—E. M. Coleman, Louisville, Ky.

Treasurer—A. B. Conklin, Aurora, Ill.

Members of the Executive Board—Charles E. Hull, Illinois; J. S. Bellamny, Iowa; O. Rex, Indiana; Richard Valentine, Wisconsin; W. Guy Jones, Ohio; H. G. Conger, Missouri; W. Mathews, Kentucky Charles W. Wells, Kansas; J. G. Splane, Pennsylvania; O. Rex, chairman.

Mr. Hall (Pittsburg): I move that a vote of thanks be tendered to retiring officers for their efficient services of last year.

Seconded and carried.

On motion, duly seconded, the convention adjourned.

THE BANQUET.

The convention wound up with a banquet and concert, which was heartily enjoyed. The principal speakers and subjects were:

"Publicity in the Telephone Business," Hon. Henry A. Barnhart, Rochester, Ind.

"The Hello Girl," Gilbert Thompson, Lebanon, Ohio.

"Telephone Troubles," Hon. E. J. Clapp, Aurora, Ill.

"All Is Lovely," Frank G. Jones, Chicago, Ill.

"The Iowa Idea," J. S. Bellamy, Knoxville, Iowa.

Hon. Chas. E. Hull, the past president of the association, was toastmaster.

MANUFACTURERS AND REPRESENTATIVES IN ATTENDANCE.

American Electric Telephone Company, Chicago—P. C. Burns, J. G. Ihmsen, H. P. Clausen.

American Electric Fuse Company, Chicago—Frank G. Jones, J. A. Kenny.

Andrae & Sons' Company, Julius, Milwaukee—Otto Borchert, J. C. Schmidtbauer.

Automatic Electric Company, Chicago—H. D. Critchfield, J. F. Crook, H. S. Durant, H. D. Ogden, W. E. Cook, J. L. Lucia.

American Stone Conduit Company, Chicago—George M. Painter, W. W. Smyth.

Anderson & Sons, W. H., Detroit, Mich.—W. R. Anderson, Thomas H. Tapp.

American Carbon and Battery Company—T. P. Gleeson.

American Electrical Works, Providence, R. I.—Francis E. Donahoe.

American Circular Loam Company—T. G. Greer.

American Conduit Company, New York—John R. Cravens, W. J. Barrett.

American Steel and Wire Company, New York and Chicago—J. W. Mecker, Jr.

Badt & Company, F. B., Chicago—F. B. Badt, C. M. Willis.

Barr Manufacturing Company, W. J., Cleveland—W. J. Barr.

Bissell Company, F., Toledo, Ohio—W. S. Bissell, M. S. Walker, E. B. Terry.

Bullock & Company, T. H., Chicago—T. H. Bullock, L. G. Le Bourveau.

Baker Engine Company—Ellis B. Baker.

Belden Manufacturing Company, Chicago—Joseph C. Belden.

Baird Manufacturing Company, Chicago—J. C. Finch.

Brooks, Hall L., Tomahawk, Wis.

Beidler & Company, Francis, Chicago—M. B. Cross.

Chicago Telephone Supply Company, Ekhart, Ind.—George A. Driggs, R. L. McCoy.

Crawfordsville Wire & Nail Company, Crawfordsville, Ind.—Robert Schweitzer.

Chicago Nut Company, Chicago—C. F. Messinger.

Crumb & Company, W. H., Chicago—W. H. Crumb.

Cook, Frank B., Chicago—Frank B. Cook, J. A. Cook, H. R. Cook, J. F. Tompkins, C. E. White, F. A. Parker.

Chicago Insulated Wire Company, Chicago—W. M. Smith, T. C. Turlay.

Camp Company, H. B., Chicago—J. A. Hammett.

Crouse-Hinds Electric Company, Syracuse, N. Y.—F. S. Skell, A. C. Dulsky.

Chicago Writing Machine Company, Chicago—F. W. Pardee, R. E. Hill, S. J. Siegfried, F. W. Krengel.

Central Telephone & Electric Company, St. Louis, Mo.—J. S. Cuming, C. H. Wallis, W. F. Gradolph.

Chicago Die & Electric Company, Chicago—M. L. Bowker.

Carney Brothers' Company, Chicago—E. E. Kaufman.

Cooledge, Marshal H., Minneapolis—T. H. Canfield.

Current Electric Company, Chicago—N. S. Harter.

Chattanooga Pole Company, Chattanooga, Tenn.—W. E. Norval.

Eureka Electric Company, Genoa Ill.—I. J. Kusel, H. G. Kusel, W. H. Foote, V. Rosenow, R. Mitten.

Ewing-Merkle Electric Company, St. Louis, Mo.—William G. Brown.

Electrose Manufacturing Company, Brooklyn, N. Y.—H. E. Cobb.

Elmore-Fowler-Jacobs Company, Chicago—Ettinger Elmore.

Elliott Addressing Company, Chicago—A. R. Baker.

Empire Electric Supply Company, Chicago—C. L. Hibbard.

Electric Appliance Company, Chicago—I. A. Bennett, S. A. Dinsmore.

Fowler-Jacobs Company, Chicago—John H. Fowler.

Fulmer-Kuester-Schroeder Company, Chicago—J. W. Fulmer, D. M. Fulmer, H. C. Miller.

Farr Telephone and Construction Supply Company, Chicago—C. W. Farr.

Gordon Battery Company, New York—E. M. Deems.

Gould Storage Battery Company, New York and Chicago—E. L. Draffin.

General Engineering Company, Chicago—George W. Conover, E. M. Hammer.

Guarantee Telephone and Equipment Company, Chicago—F. J. Mason.

Hipwell Manufacturing Company, Allegheny, Pa.—H. H. Hipwell, Todd H. Hipwell.

Hussey Company, Allen, Chicago—C. J. Huff.

Huebel Company, C. J., Menominee, Mich.—C. J. Huebel.

Holtzer-Cabot Electric Company, Brookline, Mass.—E. R. Harding.

Harvard Electric Company, Chicago—Frederick Greer.

Indiana Steel and Wire Company, Muncie, Indiana—Robert Miller, E. F. Kitselman.

Illinois Electric Company, Chicago—F. E. Healy, N. G. Harvey, M. McNeil, C. J. Litschel, C. L. Pierce.

Illinois Electric Specialty Company, Chicago—H. O. Pugh, S. W. Moon.

International Telephone Manufacturing Company, Chicago—Henry Shafer, W. E. McCormick, F. L. Middleton.

Imperial Finance and Construction Company, Toledo, Ohio—F. H. Wheeler.

Kester Electric Manufacturing Company, Chicago—A. J. Witherell, F. G. Vickeoson.

Lindsley Brothers' Company, Chicago—E. A. Lindsley, J. A. Navarre.

Moon Manufacturing Company, Chicago—H. E. Procunier, F. H. Wood.

Monarch Telephone Manufacturing Company, Chicago—Ernest E. Yaxley, J. C. Hubacher, W. H. Trimm.

Miller Anchor Company, Norwalk, Ohio—C. H. Miller, F. B. Miller.

Maltby Lumber Company, Bay City, Mich.—E. E. Reynolds.

McRoy Clay Works, Brazil, Ind.—E. F. Kirkpatrick.

McDermid Manufacturing Company, Chicago—C. L. Burlingham.

Monarch Electric and Wire Company, Chicago—Samuel Mankowitz, H. Schwab.

National Wire Corporation, New Haven, Conn.—R. B. Abbott.

North Electric Company, Cleveland, Ohio—Charles H. North, F. F. Sapp. R. Hendrickson, F. Pratt.

Nungesser Electric Battery Company, Cleveland, Ohio—H. G. Robbins, Thomas G. Grier.

Nicholas Selective Company, Rochester, N. Y.—W. G. Rich, C. A. Rich, C. E. Nicholas.

National Carbon Company, Cleveland, Ohio—F. H. Murray, M. H. Moffett, A. V. Ward.

New Haven Novelty Machine Company, New Haven, Conn.—H. Grant Thompson, Charles Luke, H. J. Minhinnick.

National India Rubber Company, Bristol, R. I.—P. F. Lyons.

Norstrom Lockout Telephone Manufacturing Company, Chicago—N. E. Norstrom.

New York Insulated Wire Company, New York and Chicago—James Wolff.

National Cable and Wire Company, Pittsburg—Morris W. Mead.

Okonite Company, New York—George T. Manson, E. B. Baker.

Ohio Valley Glass Company, Pleasant City, Ohio—H. E. Cobb.

Pittsburg and Lake Superior Iron Company, Escanaba, Mich.—J. C. Kirkpatrick, H. W. Reade.

Roebling's Sons Company, John A., Trenton, N. J.—George C. Bailey, W. H. Slingluff. G. W. Swan, W. W. Alfesk.

Raber & Watson, Chicago—P. E. Raber, A. D. Watson, M. E. Brown.

Signalphone Manufacturing Company, Milwaukee—E. E. Salisbury, R. B. Rogers.

Sterling Electric Company, Lafayette, Ind.—W. E. Doolittle, H. A. Taylor, S. B. Fowler, H. S. Bullock, H. T. Doolittle, Evan Shelby, K. V. Murray, G. W. Metcalfe.

Standard Underground Cable Company, Pittsburg, Pa.—J. R. Wiley, E. J. Peitzcker, W. M. Rogers, A. A. Anderson.

Stroud Telephone Specialty Company, Chicago—H. D. Stroud.

Stromberg-Carlson Telephone Manufacturing Company, Rochester, N. Y., and Chicago—Alfred Stromberg, C. W. Stiger, J. J. Nate, F. E. Rotchka, F. L. Martin.

Swedish-American Telephone Company, Chicago—E. B. Overshiner, A. V. Overshiner, C. H. Macklin.

Standard Telephone and Electric Company, Madison, Wis.—J. H. Parish.

Simplex Electric Company, Boston, Mass.—J. G. Brobeck.

Townsend Cedar and Supply Company, Chicago—W. W. Townsend.

Telephony Publishing Company, Chicago—H. B. McMeal, Ed. J. Mock, Elmer E. Smith.

Vesta Storage Battery Company, Chicago—W. S. Perry, D. P. Perry, A. C. Miller.

Valentine-Clark Company, Chicago—E. H. Valentine, E. L. Clark, F. L. McGillan.

Warner Electric Company, Muncie, Ind.—T. W. Warner.

Williams-Abbott Electric Company, Cleveland, Ohio—L. Sands.

Western Telephone Manufacturing Company, Chicago, Ill.—James E. Keelyn, E. Schwartz, W. G. Peacock, H. G. Johnson.

Wesco Supply Company, St. Louis, Mo.—J. W. Hardy.

Western Lumber and Pole Company, Denver, Colo.—B. F. Vreeland.
Waterbury & Company, New York and Chicago—T. O. Raaen.
Worcester Company, C. H., Chicago—W. P. Bowring.

OTHER ATTENDANTS.

Addler, Arthur A., Commercial Telo. Co., Hudson, N. Y.
Appleman, J. S., Chicago.
Arterburn, C. I., Kansas Telo. Co., Kansas, Ill.
Asire, G. H., Logansport, Ind.
Bandy, George N., Hawkeye Telo. Co., Des Moines, Iowa.
Barnes, John E., Logansport, Ind.
Barnhart, Henry A., Rochester Telo. Co., Rochester, Ind.
Bastin, H. V., Bastin Telo. Co., Lancaster, Ky.
Bates, E. I., Chippewa Co. Telo. Co., Eagle Point, Wis.
Beers, George W., Fort Wayne, Ind.
Bell, J. H., Hoosier Telo. Co., Salem, Ind.
Bellamy, J. S., Knoxville Electric Co., Knoxville, Iowa.
Berve, Louis, Ogle Co. Telo. Co., Rochelle, Ill.
Bines, Robert, Chicago.
Brailey, James S., Jr., Toledo Home Telo. Co., Toledo.
Brenton, Clyde, Mutual Telo. Co., Des Moines, Iowa.
Brodt, J. H., Central Mutual Telo. Co., Rockwell City, Iowa.
Bromley, T., Jr., Delaware and Madison Counties Telo. Co., Muncie, Ind.
Brooks, L. L. C., Twin City Tel. Co., Minneapolis, Minn.
Butler, W. H., Portage Co. Telo. Co., Kent, Ohio.
Carson, B. C., Valley Telo. Co., Bay City, Mich.
Carter, Alva J., Seymour, Ill.
Champlin, John, Westerly Automatic Telo. Co., Westerly, R. I.
Cheadle, C. B., Joliet, Ill.
Clark, Nerge, Home Telo. Co., Bowling Green, Ky.
Cleaver, H. M., Lewis Co. Telo. Co., Canton, Mo.
Coleman, E. M., Louisville Home Telo. Co., Louisville, Ky.
Conklin, A. B., Interstate Ind. Tel. and Telo. Co., Aurora, Ill.
Cornell, K. G., Brighton Telo. Ex. Co., Brighton, Iowa.
Crall, E. A., Menomenee Range Telo. Co., Iron Mountain, Mich.
Crossley, Powel, Cincinnati Telo. Co., Cincinnati, Ohio.
Daniel, W. S., Knox, Ind.
Davenport, H. H., Valley Tel. and Telo. Co., Green Bay, Wis.
Diggs, A. B., Winamac, Ind.
Dobbs, A. E., Chicago.
Duncan, J. A., Home Telo. Co., Ft. Wayne, Ind.
Dunsmore, W. D., Oskaloosa, Iowa.
Durin, W. H., Cedar Rapids and Marion Telo. Co., Cedar Rapids, Iowa.
Ebersole, F. E., Evansville Telo. Co., Evansville, Ind.
Edwards, J. S. G., Johnstown, N. Y.
Fenton, Dr. C. S., Jefferson and Warren Telo. Co., Orangeville, Ohio.
Finch, George W., Finch's Telo. Exch., Escanaba, Mich.
Fitzgerald, Guy W., Union, Iowa.
Foote, George D., Danville, Ind.
Forbes, C. W., United Tel., Telo. and Elec. Co., Chicago.
Frazee, L. A., Connersville Telo. Co., Connersville, Ind.
Freeman, C. E., Armour Institute, Chicago, Ill.
Friend, T. J., Flora, Ill.
Fuller, D. E., Clyde Telo. Co., Clyde, Ohio.
Gary, Theodore, Macon Telo. Co., Macon, Mo.
Gates, Harry B., Queen City Telo. Co., Cincinnati, Ohio.
Glandon, Ed. D., Pike Co. Telo. Co., Pittsfield, Ill.
Goldsborough, W. E., St. Louis.
Goodrich, W. F., LaCrosse Telo. Co., LaCrosse, Wis.
Grismore, J. R., Charleston, Ill.
Hall, R. L., Cynthiana Telo. Co., Cynthiana, Ky.
Hall, Robert C., Pittsburg and Allegheny Telo. Co., Pittsburg, Pa.
Hanway, Thad. E., Monticello, Ind.
Harvey, H. A., United Telo., Telg. and Elec. Co., Chicago.
Hawley, A. G., Tri City Telo. Co., Clinton, Iowa.
Healey, J. S., United Tel., Telo. and Elec. Co., Chicago.
Henderson, N. M., Lewis Co. Telo. Co., Canton, Mo.
Hennis, E. C., Northern Ill. Telo. Co., Sandwich, Ill.
Hennis, Mrs. E. C., Sandwich, Ill.
Herr, Henry S., Ottumwa Telo. Co., Ottumwa, Iowa.
Holdeogel, P. C., Central Mutual Telo. Co., Rockwell City, Iowa.
Howes, E. E., Madison Telo. Co., Geneva, Ohio.
Howk, C. L., The Local Telo. Co., Norwalk, Ohio.
Hoyle, Charles, Chicago.
Hudson, J. A., Columbia Telo. Co., Columbia, Mo.
Hughes, C. O., Monticello, Ind.
Hull, Charles E., Salem Telo. Co., Salem, Ill.
Hyde, E. U., Jefferson and Warren Telo. Co., Orangeville, Ohio.
Hyneman, L. F., Home Tel. Co., Lexington, Ill.
Johnson, R. F., Valley Telo. Co., Saginaw, Mich.
Jones, C. L., Athens Telo. Co., Athens, Ohio.
Jones, W. Guy, Home Telo. Co., Columbus, Ohio.
Kennedy, J. M., Kirksville Telo. Co., Kirksville, Mo.
Kirkpatrick, A. C., Northern Ill. Telo. Co., Sandwich, Ill.
Knox, E. E., Portsmouth Telo. Co., Portsmouth, Ohio.
La Follette, John, Blakesberg Telo. and Telg. Co., Blakesberg, Iowa.
Lakey, L. E., Markle, Ind.
Laubach, W. F., People's Telo. Co., Akron, Ohio.
Laurey, W. B., Audubon Co. Telo. Co.
Lee, Lon, Home Telo. Co., Champaign, Ill.
Liggett, N. E., Marysville Telo. Co., Marysville, Ohio.
Light, Frank, Jefferson Co. Telo. Co., Fairfield, Iowa.
Lake, Silas, Lewis Co. Telo. Co., Canton, Mo.
Loring, A., Northern Ill. Telo. Co., Sandwich, Ill.
Marsh, C. E., Valley Telo. Co., Saginaw, Mich.
Marvin, C. H., Toledo Home Telo. Co., Toledo.
Matthews, W., Maysville Telo. Co., Maysville, Ky.
Maxson, J. I., Westerly Automatic Telo. Co., Westerly, R. I.
McMeal, H. B., Telephony Publishing Co., Chicago.
McQuiston, F. H., Jefferson Co. Telo. Co., Fairfield, Iowa.
McWithy, Harold E., Bloomer Telo. Co., Bloomer, Wis.
Meyers, C. S., Westfield Telo. Co., Westfield, Ill.
Meyers, Harvey, Memphis Telo. Co., Memphis, Tenn.
Middleton, D. R., Minneapolis, Minn.
Middleton, J. B., Duluth, Minn.
Middleton, M. G., Minneapolis, Minn.
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Mock, Ed. J., Telephony Publishing Co., Chicago.
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Morrison, L. C., Northern Ill. Telo. Co., Plano, Ill.
Morrissey, D. C., Home Telo. Co., Champaign, Ill.
Moulton, E. H., Twin City Telo. Co., Minneapolis, Minn.
Neher, L. M., Royal Telo. Co., Milford, Ind.
Newberry, S. H., Ashtabula Telo. Co., Ashtabula, Ohio.
Neymayer, Theodore, Aurora, Ill.
Orr, B. S., Attica Telo. Co., Attica, Ind.
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Parmelee, Tom E., Plattsmouth Telo. Co., Plattsmouth, Neb.
Patten, F. B., Chicago
Penn, Jerome, Home Telo. Co., Washington C. H., Ohio.
Pitcher, Louis A., Lee Co. Telo. Co., Dixon, Ill.
Pixley, O. C., Chicago and Des Moines.
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Prewitt, David, Old Ky. Telo. and Telg. Co., Winchester, Ky.
Price, H. A., Valley Telo. Co., Bay City, Mich.
Ramsey, W. H., Auburn Telo. Exch., Auburn, Ill.
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Reeve, C. A., Plymouth Telo. Exch., Plymouth, Ind.
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Robinson, William, Citizens' Telo. Co., Muskegon, Mich.
Routh, J. A., Mutual Union Telo. Co., Abingdon, Ill.
Sabine, T. C., Farm and City Telo. Co., Clinton, Ill.
Salter, E. P., New York Journal of Commerce, New York.
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Wheeler, Geo. E., Burlington, Iowa.
Whitcomb, Fred, Seymour, Ind.
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Composite Telephony.

C. H. COAR.

Many circuits have been devised in the past capable of transmitting telegraph and telephone messages simultaneously without interfering with each other. The object of this article is to bring to mind some of the possibilities of the simpler ones, rather than present any new circuits.

In all grounded circuits such as Figs. 1 and 2 the application of a condenser in series with each telephone makes these circuits possible. Condensers will not transmit constant or slowly pulsating currents through them; but to alternating currents of varying intensity they present an easy path.

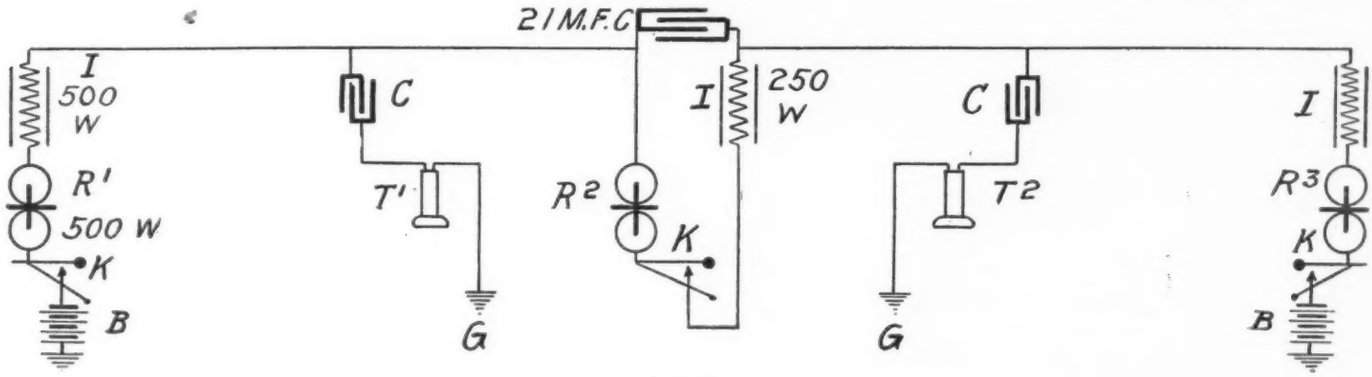


FIG. 1.

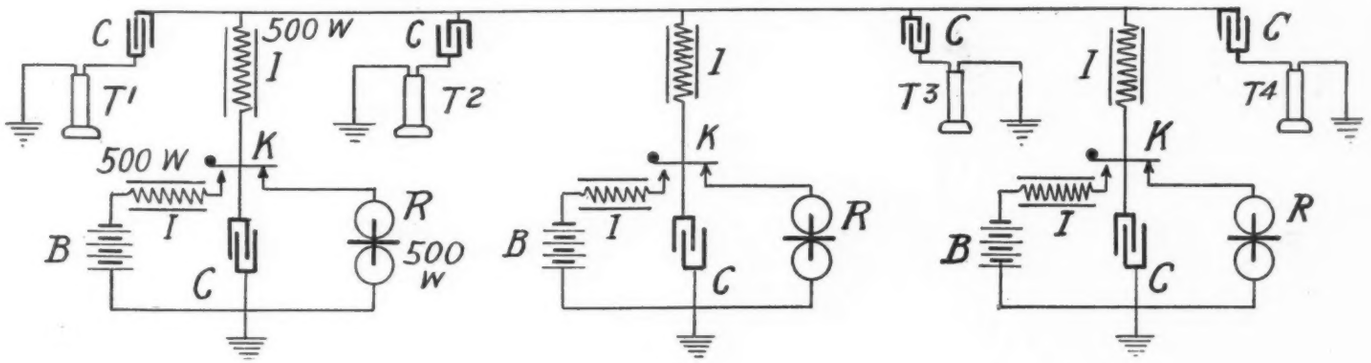


FIG. 2.

Telegraphic currents are continuous and usually of constant intensity; therefore, they would not flow through the condensers, but the rapid opening and closing of the telegraph circuit would cause a reproduction in each condenser.

To prevent these rapid fluctuations in the line current, impedence coils are inserted in series with each telegraph instrument. Each coil should be surrounded by an iron shell. In this condition their high self-induction produces counter currents, which retard the rapid changes in the line current.

As talking current is very variable but a small amount of this escapes through these coils.

While the ultimate purpose of the condenser is to prevent the telegraph current from entering the telephone, and that of the impedance coils is to do likewise for the telegraph instruments against the talking current, they both serve another purpose.

During an increase in actual C. M. F. in a circuit, counter currents of self-induction tend to weaken or retard this

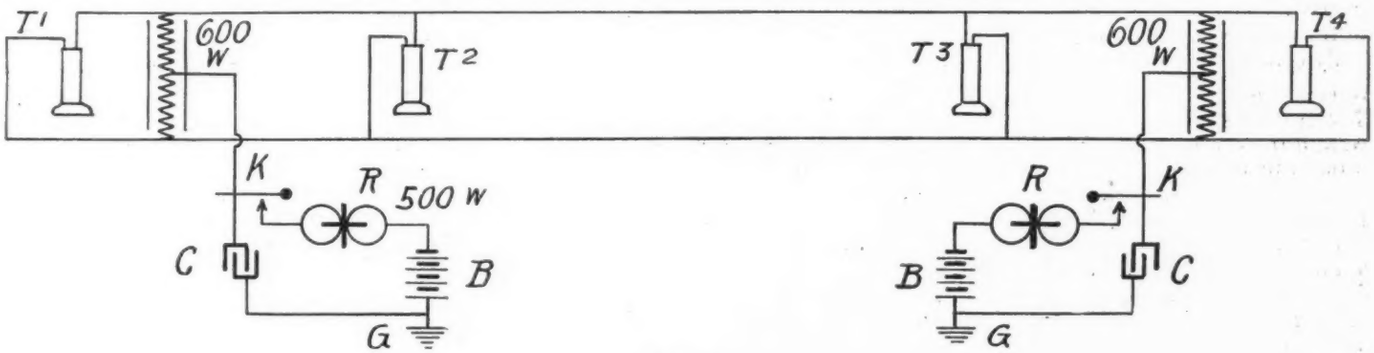


FIG. 3.

increase, while they strengthen or help a decrease. A condenser absorbs its charge at the time the actual C. M. F. is greatest and discharges during the time it is weak.

The C. M. F. due to capacity is in advance of the actual line C. M. F., while that of self-induction lags; thus the C. M. F. of capacity and self-induction tend to neutralize each other, thereby keeping the line in balance.

In the diagram *I* stands for impedance coils, *C* for condensers, *R* for relays, *K* for keys, *B* for battery and *T* for telephones.

The circuit in Fig. 1 consists of a grounded telephone line, with two budging telephones, *T 1* and *2*, and three telegraph stations, *R 1*, *2* and *3*. The telegraph stations are in series with each other and would require a closed circuit battery to operate them.

Each telephone has a condenser in series with it; while the telegraph relays have a coil, the objects of both have been explained.

The telephone and telegraph, both of which work as usual, may be operated at the same time without interference.

In Fig. 2 the telephone conditions are the same as Fig. 1, but the telegraph circuit changes from series to multiple. Open circuit cells can be used to operate the telegraph instruments as the battery remains open at all times the instruments are not in operation. The extra impedance coil inserted in the battery circuit is to balance the line during the operation of the key. By referring to Fig. 2 it will be seen that as soon as a key is pressed it raises out of the relay circuit, into the battery circuit, the impedance coil replaces the resistance coil by the opening of the relay.

This system presents two bad features: First, the operator is not able to hear his own message during the sending of it; second, the instruments being operated in multiple one would receive a greater supply of battery than another according to its relative position with the sending set.

A condenser is tapped from each key to ground in view of obtaining the first possible line balance.

Fig. 3 presents the most practical plan, which consist of a metallic circuit with four bridging telephone stations. Taps are run from the center of each impedance coil to the telegraph sets. The earth is used for the return in telegraphing. The telegraph current splits itself at the coils, part going over each line wire, thus neutralizing itself in the telephones. The coils themselves do not cut down the efficiency in talking owing to their high retardation to these currents. The resistance over each respective line wire from the taps at the coils should be the same, in order that each line will get an equal share of the telegraph current.

The condensers from the keys to ground serve the same purpose as in Fig. 2.

In the circuits described herein the condensers have a 2+ M. F. capacity, although some of lower capacity work equally as well; the telephones are bridging equipped with 1,600 ohm ringers, and the telegraph relays are wound to 500 ohms resistance.

As a rough estimate for battery strength in circuits with 500 ohm relays, allow a cell for each 100 ohms resistance to be overcome.

With proper care, circuits of this description will give very satisfactory service over both the telephone and telegraph.

The Efficiency of Telephone Cable with Uniformly Distributed Self Induction

T. Dolezalek and A. Ebeling in Elektrotechnische Zeitschrift.

For a long time past endeavors have been made to minimize the detrimental influence of the electrostatic capacity of long-distance telephone lines by increasing their self-induction. An artificial increase of the self-induction may be obtained in two ways: First, by surrounding the copper conductor with magnetic material, such as iron, etc., or, secondly, by interrupting the line at certain distances and inserting in the gap coils of high self-induction. Experiments were undertaken to determine how far the damping of the current waves could be diminished by the first method and if this means of increasing the self-induction could successfully compete with the second method.

Experimental researches with regard to iron-covered cables have already been conducted by Breisig and Krarup. The former investigated different types of telegraph cables, wound in various ways with iron wire or iron strip, the best result obtained being a rise in self-induction per kilometer from 0.00235 to 0.00370 henry, an increase of 57 per cent. Krarup, by covering his conductor with thin iron wire, obtained much better values, the best being 0.010 henry per kilometer. Our measurements show that higher self-inductions may be obtained and put to a useful purpose. The cables tested were connected to a Wheatstone bridge, with a telephone as zero indicator. When measuring the self-induction, the go-and-return conductors were short-circuited at their distant ends and connected as one arm of the Wheatstone bridge. The adjoining arm contained a variable self-induction coil and a non-inductive resistance. When measuring the capacity the far ends of the caste were not connected, and instead of the self-induction coil a condenser was inserted into the third arm of the bridge. The test to determine the self-induction is somewhat influenced by the capacity of the cable, this behaving itself—in the presence of the alternating measuring current—as a resistance possessing self-induction with a condenser in parallel. A very simple calculation results in the following equation, which gives the connection existing between the measured self-induction L_1, the real self-induction L, the capacity C and the resistance R of the cable, $L_1 = L - p^2CL^2 - CR^2/(1 - p^2CL)^2 + p^2C^2R^2$, wherein p denotes the frequency of the measuring current multiplied by 2π. With the cables measured, the resistance R and the capacity C are relatively small, and only the term CR^2 exceeded 1 per cent, so that approximately $L = L_1 + CR^2$. This correction CR^2 attained in the most unfavorable condition the value of 15 per cent.

Two conductors of 2.5 mm. in diameter were covered with several layers of iron wire, 0.7 mm. in diameter, the iron wire being wound directly upon the copper. The two conductors were held apart at a distance of 31.5 mm. After each layer had been applied, the self-induction was measured. In Table 1 the results are reproduced:

TABLE I.

Iron.	Diameter over mm.	Self-induction in henrys per km.
Without iron	...	0.00152
One layer of iron wire	4.0	0.0126
Two layers of iron wire	5.3	0.0200
Three layers of iron wire....	6.7	0.0257
Four layers of iron wire	7.9	0.0302
Five layers of iron wire	9.0	0.0342

In an incidental conversation with Prof. M. Wien he mentioned that, according to his experience, the magnetic properties of iron suffered on being wound around the con-

ductor, and that, therefore, a subsequent annealing was necessary. This view was confirmed, for, after annealing, the self-induction of the cable loop, wound with five layers, rose from 0.0342 to 0.067 henry. A practical application of a layer of iron wire 0.7 mm. thick is out of question, because the eddy current losses would be much too high. In fact, a measurement in this direction gave the apparent resistance per kilometer for an alternating current of 900 ~ per second as 83 ohms, whereas, when measured with continuous current, the resistance was found to be only 5.5 ohms.

In a second series of measurements, a cable of the same dimensions as the first one tested was wound with two layers of iron wire .015 mm. in diameter, and its self-induction was found to be 0.0121 henry per kilometer, the apparent resistance at the high frequency (900 ~) being 6.3 ohms per kilometer. It will, therefore, be seen that a substantial increase in self-induction, accompanied by but a small rise in resistance, may be obtained by using thin wire, but for practical purposes smaller values of the self-induction have to be chosen on account of the increase in capacity. Table 2 contains data referring to iron layers wound in various ways and with various thicknesses of iron wire:

TABLE 2.

	Per km. double line.				
	Weight iron Kg.	Resistance. Ohms.	Mutua capacit. Mfd.	Self-induction. Millihenrys.	Apparant percentage rise in resistance at a frequency of 900 ~
Paper-insulated Cable with Copper Conductor 0·8mm. in diameter:					
Ordinary cable without iron...	..	61·0	0·031	0·84	0
Conductor covered with iron wire 0·15mm. in diameter; 610 turns per meter.....	0·5	63·4	0.034	1·41	0
With strand of four iron wires, each 0·15mm. in diameter, 600 turns per meter.....	2·40	65·4	0.044	3·38	0
Stranded iron wire, consisting of 14 strands, each 0·15 mm. in diameter, 530 turns per meter..	7·60	66.0	0·042	6·77	0·5
Covered with iron wire, 0·5mm. in diameter, 820 turns per meter	9·64	59·4	0.045	7·49	1·6
Covered with iron wire 0·5mm. in diameter, 1,350 turns per meter	14·6	64·4	0·065	12·1	3·0
Paper Insulated Cable with Copper Conductor 1·5mm. in diameter:					
Ordinary cable without iron. .	..	17·64	0·044	0·63	..
Conductor covered with strand of 14 iron wires, each 0·15mm. in diameter, 500 turns per meter	11·10	18·46	0·054	5·06	1·5
Covered with iron wire, 0·5mm. in diameter, 1,040 turns per meter	14·56	17·70	0·057	5·92	6·0

It will be gathered from these tables that the self-induction increases approximately with the weight of the iron surrounding the copper. The iron in these tests had not been annealed.

Lines with added inductance in the shape of coils distributed over their length possess the advantage that an increase in self-induction does not go hand in hand with an increase in capacity, as is the case in a marked degree with iron-covered conductors. Further, with the same quantity of iron employed in both cases, the increase in self-induction on the coil system is incomparably larger than in the other case. This result applies not only to land telephone cables, but also to submarine cables, and, since these are laid mostly in shallow waters, no insurmountable difficulty should be experienced in building the self-induction coils into the cable.

The telephone system of Uganda, in Africa, is, with its branches, 1,034 miles in extent, the poles being living trees. The charge is .32 cents for each conversation over any distance.

GROWTH OF INDEPENDENT TELEPHONE SERVICE.

The most noticeable development of recent times has been that of Independent telephone companies when compared with the business of the Bell company, at one time in practical monopoly of the business. That the latter company no longer controls the situation is too patent to deny.

Modern social and business development has proceeded more rapidly than it lay within the power of any one concern to cope with, even were it not handicapped by the loss of control of expired fundamental patents and the passing into other hands of the ownership of improvements.

To-day the telephone is everywhere—in offices, factories, trains, steamships, churches, on the farm (and this latter application is noteworthy for its rapidly increasing adoption). War as well as peace calls for it. To prophecy its future is beyond any one.

One of the trade journals, TELEPHONY, has been making a canvass for statistics, and from partial returns from 16 states, prints the following table of comparative service afforded by the various telephone companies.

State.	Exchanges.		Bell Telephones.	Independent Telephones.
Wisconsin	26	Cities show	4,193	10,954
Michigan	15	"	6,801	12,363
Illinois	13	"	5,982	10,568
Indiana	21	"	4,171	18,216
Ohio	47	"	14,361	35,612
Kentucky	6	"	4,290	11,323
Massachusetts	3	"	5,256	2,425
Kansas 5		"	1,450	4.575
Texas	10	"	7,210	7,608
Florida	1	"	420	1,170
New York	19	"	16,011	21,868
Iowa	10	"	4,969	9,006
New Mexico	1	"	325	385
Georgia	2	"	2,350	2.800
Pennsylvania	6	"	3,334	6,580
Missouri	3	"	2,200	2,850
In 16 states 188		"	84,323	158,393

This is interesting, not so much as showing one force stronger than another, but particularly as a study of growth. Half a score of years ago, it will be remembered, there were no Independent companies.

One thing can be foreseen in this and all such tables and that is, as a unification of Bell and Independent interests is concededly out of the question, the side that gains a great economic advantage over the other will achieve a commanding position of tremendous significance, whether such advantages be localized or general.

The immediate necessity for such economy is in the field of operating expenses—the heaviest item.—*Cent per cent; New York.*

Advices from Boston say: "There is no question but that there has been selling of American Telephone stock by prominent trustee interests who fear that the 'extra' dividends are not of long duration. The selling movement in American Telephone became more pronounced when the Bell Telephone Company of Philadelphia, in which the American company owns eighty per cent of the $12,000,000 stock, reduced its dividend from eight to six per cent, for this action was considered by the street an advance notice of a coming change in American Telephone and Telegraph Company's dividend policy."

The stock of the American Telephone and Telegraph Company is going down steadily and it is not believed it can be bolstered up even temporarily. The holders of Bell stock and securities will turn to the Independents for permanent and safe investments.

New Independent System at Kenosha.

The Independent telephone exchange which has just been opened for service at Kenosha, Wisconsin, presents many points of interest, representing as it does the great progress which is being made in modernizing construction, as it shows the first switchboard equipment installation in which a system of one thousand lines can be operated successfully without either transfer trunking or multiple. This switchboard is a radical departure from those commonly used. Not only new features in the matter of equipment are offered, but also innovations in service as handled by the Independent people. Amongst these latter are special features, such as six, eight, ten and twelve-party selective service.

The Citizens' Telephone and Telegraph Company of Kenosha, Wisconsin, was organized in December, 1902, and before ground was broken had secured contracts for four hundred subscribers which list was increased during the

"WESTERN" 1,000 LINE KEELYN COMBINATION SWITCHBOARD

period of construction and installation, the new exchange opening with about 800 patrons.

The designing of the entire plant, including every detail of buildings and equipment and the execution of all work has been in the hands of James E. Keelyn. Mr. Keelyn was assisted by C. E. Egan, superintendent; W. G. Peacock, engineer; Geo. J. Newton, installation expert, and E. Schwartz, mechanical expert.

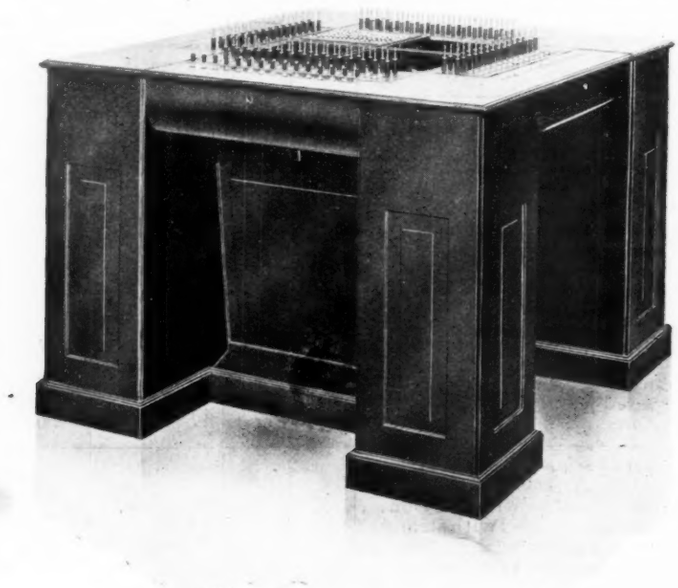
The Kenosha plant comprises about eight hundred miles of wire on cross arms, 1,000 miles of wire in aerial cables and 2,500 miles of wire in underground cables. National cable of conference specifications is used. All distributing poles are equipped with "Western" circles, terminal heads and special platforms. The underground cable is mostly two hundred pair and the multiple system of distribution is used.

The line construction is of the composite style. The central part of the city and all main leads are of underground construction, brought out to terminal distribution in the center of each block. About 200,000 feet of underground conduit has been laid. The conduits are of the American Conduit Company's product and are laid in concrete throughout. Manholes of concrete, iron-capped, are provided at all street and alley intersections, anticipating future requirements of 3,600 subscribers.

From the underground district to the suburbs the major part of the city is provided through aerial cables which lead upon lines of Michigan white cedar, forty to sixty feet poles, painted and stepped throughout.

The suburban and outlying districts are covered by overhead wires of the best B. & B. galvanized iron. All wires passing through trees, as well as surface wires, are of heavily braided rubber insulation. All cross-arms are ten-pin yellow pine weather treated. All pins are locust and double-grooved pony glass insulators are used except where transpositions are made.

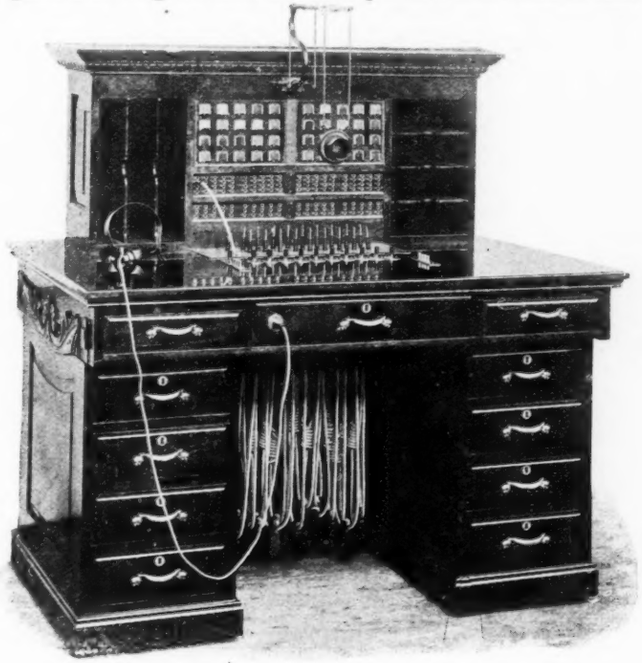
On the question of exchange equipment it was decided to install the new Keelyn combination switchboard, which al-



"WESTERN" 1,000 LINE KEELYN COMBINATION SWITCHBOARD.

lowed putting in a full central energy lamp signal, two wire multiple circuit switchboard, manufactured by the Western Telephone Manufacturing Company. Frame capacity and partial installation is for twenty-four hundred lines, and complete installation is made for one thousand lines. The switchboard is so arranged that any operator can make direct connection with one thousand lines without trunking or multiple. An increase to two thousand lines means the addition of a duplicate section and only one set of multiples. Each operator's position is equipped with fifteen pair of cords and plugs, double supervisory lamp signals, fifteen ringing and listening keys, for selective signaling, one special breast transmitter and head receiver, pilot lamp, etc. The switchboard frame is of steel, strongly braced; cabinet work is of mahogany, made in a highly artistic and substantial manner. A 100-capacity toll board of the same material and finish as that of the main switchboard is located in the operating room. The toll board is equipped for fifty magneto and fifty common battery lines together with the

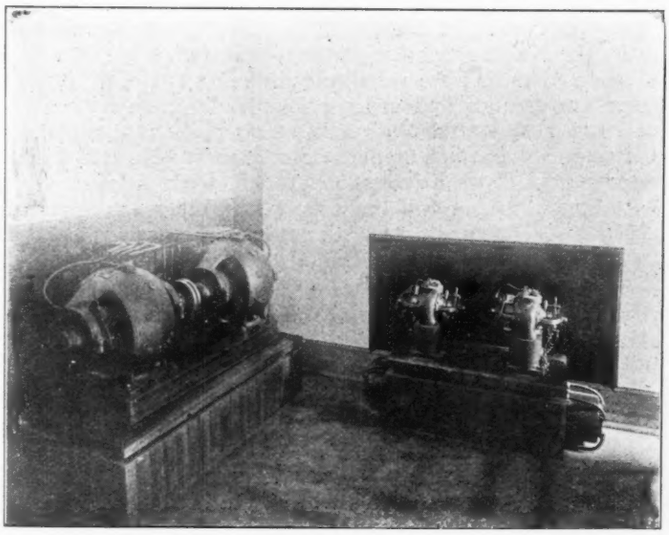
necessary trunks connecting to the main switchboard. Advanced ideas in the art of toll equipment are apparent in the construction and operation of this board. Drops are of the generator-call, relay type, capable of repeating any number of calls, clear-outs are of the lamp-signal pattern operated by generator ring-off and are more positive and reliable than



"WESTERN" 100-LINE TOLL BOARD.

the old style of drop clear-outs. Selective keys designed for four, eight and twelve party service add to the completeness of the equipment.

In examining the central office equipment, and especially the main switchboard, surprise is occasioned at the simplicity and compactness of the apparatus used in accomplishing results that usually require the use of switchboards four



2,400 CAPACITY POWER EQUIPMENT.

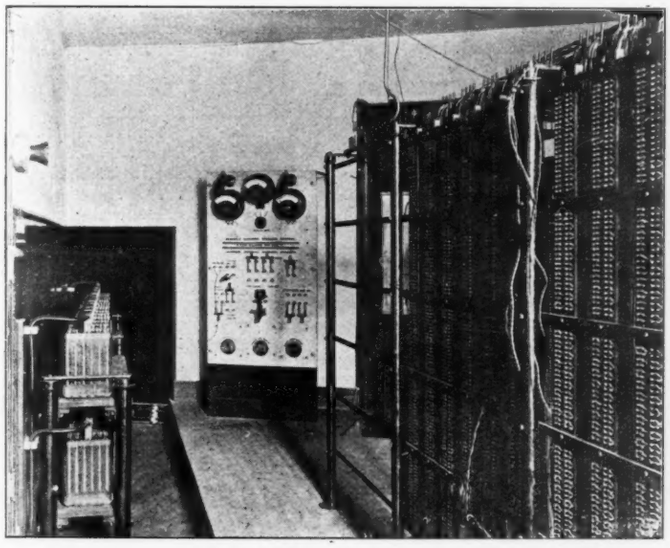
times as large in caliber, and three to eight times as many spring-jacks.

In the terminal room is located the main distributing board, intermediate rack, wire chief's desk, complete with testing apparatus. The main and intermediate rack are both of the American Electric Fuse Company's type and are equipped with protectors for heavy and sneak currents and lightning. Protectors are of the self-soldering type.

The storage battery equipment consists of duplicate sets of special Porter batteries of sufficient capacity for a three-thousand-line switchboard. The power switchboard is of pure white marble mounted on an iron frame, and is completely equipped with Western flush type ammeter and voltmeter, automatic over-load and under-load, circuit breaker,

"WESTERN" MONITOR AND CHIEF'S DESK.

fuses, buss-bars, rheostats, starting boxes and all necessary switches, the latter are of the Crouse-Hinds tubular arm type. The power plant contains Wagner single phase motors direct connected to Roth type generators. Duplicate ringing machines of the Roth type complete with busy back, howler, and pulsating attachments are also installed.



SECTION OF TERMINAL RACKS.

Every detail of this system shows up to the highest advantage and no expense has been spared to make it first-class in every particular. The apparatus throughout was supplied by the Western Telephone Manufacturing Company, and the entire construction and installation was made under contract with the new Western Telephone Construction Company.

The new Kenosha exchange is connected with Racine.

Telephony.

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THE PASSING OF THE AMERICAN TELEPHONE JOURNAL.

The only discordant note at the recent Interstate Independent Telephone Association convention was the reading of a paper by William Henry McDonough, editor of the *American Telephone Journal,* entitled, "Are Our Telephone Periodicals Sufficiently Careful as to the Business Relations Sustained by Contributors?" The paper is republished in full in this issue of TELEPHONY, and was republished *in part* in the *American Telephone Journal* of December 19. Mr. McDonough published this paper in part, we presume, for the same reason that he did not read the paper as it was originally written. This publication very rarely makes mention in its editorial columns of any such petty attack, but this was so underhanded that we simply state a few facts in connection with it, so that the few telephone men who read the *American Telephone Journal* may not be misled. In the first place, Mr. McDonough had to quote at length from correspondence from E. M. Coleman, secretary of the association, to show any excuse for the reading of the paper, and in the second place he placed the odium of the effort on the association, inasmuch as the paper was read at the association's request. This may be considered clever (?), but it reflects honor neither on Mr. McDonough nor the association's secretary. The paper in itself is such a puerile, weak effort, that it fell flat. The one instinct in the heart of every Independent is fairness, and when Mr. McDonough in his paper cast insinuations and slurs at another publication, without being fair enough to clearly state the name of that publication, he did that which is not honorable. The name of the publication was not made known until the editor of this publication made the statement before the convention that Mr. McDonough meant TELEPHONY, but was not fair enough to say so.

Mr. McDonough thought TELEPHONY was *not* sufficiently careful because it had published articles by Fred DeLand, Oscar Wentworth Rogers, and an article that several Independent companies had shown a deficit instead of a profit. Is this all that has appeared in TELEPHONY in the past three years that is open to criticism? If so, we have done better than we hoped. In answer to Mr. McDonough we simply make the statement that TELEPHONY is *Independent,* which, as we understand the word, means being truthful and fair. Mr. McDonough and every other reader may expect and will find TELEPHONY *truthful, fearless and Independent.* It is this policy that has made the publication what it is to-day, and the poor, little, helpless, misguided, long-distance *American Telephone Journal* has bumped into it often enough in the past to know its strength and the position it occupies in the Independent field.

The pity of it was that Mr. Coleman, who is a man of parts, should allow Mr. McDonough to make such a spectacle of himself, and try to use the association as a tool. While Mr. McDonough was reading his paper and claiming TELEPHONY was publishing matter which aided the Bell, Mr. Coleman should have informed himself, by reading the convention number (December 5) of the *American Telephone Journal,* which was distributed at the convention. Then he might not have been so anxious to have Mr. McDonough posing as a good citizen and loyal Independent. On page 353 of the *American Telephone Journal* he would have found a laudatory (leading) article on the *Bell system in the treasury department.* Immediately following this, on page 356, he would have found a very interesting technical article written by *three engineers* who are now in the *employ of the Bell company.* Immediately following this, on page 359, he would have found an article by *an erstwhile Bell engineer.* Immediately following this, on page 361, he would have found an article written by *another engineer* in the *Bell employ.* Immediately following this, on page 363,

he would have found a description of a *Bell training school,* etc., etc. Before going any further or reading the article by Herbert Laws Webb (*assistant to the New York Bell manager*) on page 369, or a description of the *Bell system* on page 371, he would quite likely have thrown the book aside and asked himself: "Are our telephone periodicals sufficiently careful as to the business relations sustained by contributors?"

He might have asked himself this further question: Does this ill-timed paper by Mr. McDonough and the things that preceded it mark the passing of the *American Telephone Journal?* The answer we will leave to the future.

The greater the number of other individuals with whom it is possible for a telephone subscriber to communicate, the greater the value of the telephone service to him.

THROUGH ENGLISH EYES.

Our editorial attitude on the Kellogg situation has been criticized as prejudiced. We have heard it said that we do not look on this subject dispassionately, and that we would not judge the Kellogg company so harshly were it not for our very rampant sentiments about Bell tactics in general. We do not claim to be anything more than human, and we are free to admit that we cannot always be right, however hard we try; but from the beginning we have maintained down to the present moment, and will continue to assert, that there is no middle ground on the Kellogg situation, it is *all* bad, *all* wrong, *all* to be condemned.

Our English cousins have never been accused of an overabundance of the sentimental element in business. They have a very prosaic way of looking through and past superficialities, to ultimate conclusions. Neither can they be justly accused of a prejudice in favor of or against the Kellogg company. If one were to go far in search of a disinterested and dispassionate view point, he could find none better than that of the Englishman, five thousand miles away from the scene.

We have always contended that the Kellogg case presented such palpable evidence of Bell iniquitous methods, as to be patent to any thinking man. There has been, there can be, no possible hypothesis on which to base any other conclusion than fraud and deception in the whole proceedings and future purposes of the Bell company relating to the Kellogg company. The subjoined comment on a recent article in TELEPHONY, is from the columns of the *Electrical Times* of London, appearing in the issue of December 10. We print it verbatim and entire. Surely, if English eyes can see so clearly the Bell-Kellogg plan and its results, if carried out, there should be no Independent so blind as to put his neck in the halter prepared for him by his enemies.

AMERICAN MIXTURE.

The financial and commercial warfare of the American telephone companies concerns us but slightly here, where the operation of the Telegraphs Act places telephonic work upon an entirely different basis. In America very strange things are done, but it really seems as though the purchase in the Bell company's interest of the Kellogg Switchboard Company is about the largest and most extensive practical joke that has been brought off anywhere. The Kellogg company manufactured for the Independent anti-Bell companies, the Bell having a tributary manufacturing company of its own. The Kellogg company, selling apparatus which the Bell said infringed its patents, had to guarantee its customers against the consequence of infringement suits. The Bell, therefore, in taking over the Kellogg takes over guarantees against itself in suits which it is bringing. The guarantee would be valueless if the Kellogg company failed or wound up, but this does not at all appear to be in the Bell tactics just at present, because it is going on selling Kellogg instruments to Independent companies as before, and, it is said, offering to give bonds that it will do so in spite of having granted to other people exclusive right to the use of its patents in these companies' districts. Moreover, the price at which the Kellogg-made instruments are sold outright is rather less than the annual rental charged by the Bell company for the use of its own patent instruments made by its old factories. On the other side, the Kellogg company having got into financial difficulty owing to the Everett-Moore collapse Mr. Kellogg's interest and the control of the company was sold by his agent while he was away ill and unable to attend to business—in fact, without his knowledge. Now he and his friends want to get back the control, and the way in which he has set about it is to get a minority shareholder to bring a suit in equity against himself for having done (by his agent) what he ought not to have done, namely, sold the company to its enemy. What the American courts, which are various, may think of these complications no one seems inclined to say, but altogether it looks the prettiest tangle that has ever been produced by transatlantic tendency to trusts and patent litigation long drawn out. The play is too fine for a European to follow, but though how be not comprehensible the anger of the Independents' organ, TELEPHONY, infers them hurt.

The closing paragraph of our English contemporary is a little vague, but we will accept it in good faith, even though we do not fully understand its import.

The telephone makes the entire municipality akin, bringing the railway, the banker, manufacturer and merchant, no matter how inconveniently apart they may be situated, into instant communication, and binding the business world of a great community into a compact working unit.

A COMEDY OF ERRORS.

For many years the vaporings of the Bell Press Bureau have furnished amusement for the Independent public. So thoroughly have Bell publicity methods been exposed that it would seem as if the erstwhile monopoly would learn a lesson from experience. Notwithstanding the fact that no one is deceived any longer by its so-called official statements the Bell crowd have not changed their plan of operations in the slightest particular, but have contented themselves with introducing an endless variety into the prosaic details of a press clipping bureau, beside which the much advertised fifty-seven varieties of a manufacturer of popular pickles pale into insignificance.

A guileless outsider, absolutely ignorant of anything telephonic, would think from a perusal of current Bell literature that the one time monopoly had never heard of such a thing as competition. This, despite the fact that it is notoriously true that the Bell company has been whipped in almost every combat with an Independent exchange.

We sometimes wonder if the good people of New England, that vaunted stronghold of Bell cash resources, really believe a hundredth part of the nonsense that is poured into their ears. To admit that they do accept as facts the ex parte statements of the Bell would be to bring an indictment against their intelligence, but we confess that we are at a loss to understand how the Bell company well can continue to gush forth so profusely its watered statements as to its prosperity without showing to any man of an investigating turn of mind the utter absurdity of Bell pretensions. The time was when the periodical gushing forth of Bell stock from the fountain head of the water-soaked monopoly at Boston found many receptive sponge-like individuals, ready to absorb whatever was offered. But even sponges have the limit of their capacity to absorb. The old time Bell stockholders, swelled to bursting with watered stock, have been left out in the fierce glare and heat of the sunlight of publicity, and during the past year or so, much of the cherished water has evaporated, and has left the stockholders with only the scant remnants of their one time opulence.

The shrinkage in Bell stocks, however, has been only the natural evaporation of the enormous superfluity of liquid nourishment upon which the Bell stockholders have from the immemorial been fed. It seems almost incredible that after the disastrous experiences of the last year or so there should be any of the old guard still remaining, but it would appear that the Bell company, which has never been accused of a lack of ingenuity, failing in its efforts to find new fields for the floating of its water distended shares, and realizing that

it had loaded up its old stockholders to the limit of their capacity, had evaporated from each sponge enough of the old water to permit of the absorption of the new.

The query now is, will these sponges again saturate themselves in an endeavor to remove from their recollection the remembrance of the dry days which they have just passed.

The inspired article from which we will now quote would seem to indicate that the Bell company has the most complete faith in the capacity of its sponges. Independents are respectfully requested to endeavor to treat seriously the following statement made to the *Wall Street Journal*, as we are informed, by "an authority in the telephone business."

"The American Telephone & Telegraph must have $30,000,000 of new money each year to provide for the demands of its growing business. The company must move forward; it must put in telephones where they are demanded, even though this calls for an expensive wire cable or a single party line. In this respect the telephone industry is unlike any other. It must secure millions from the stockholders each year to finance extensions, and keep the Independents, who are pressing the big company hard at some western points, from securing an important foothold.

"New England now owns practically all the stock, and must be practically the sole contributor of new money in the future.

"The Bell companies to-day are giving too good a service for money received, in other words rates are too low, and they must be advanced. Then again, it must not be forgotten that the American company issues stock upon which it pays seven and a half per cent dividends to take up securities which net the company an average of less than six per cent. The balance of its income must be made up from royalties, now reduced to a minimum, and from the earnings of long distance lines and supplies.

"There are few people who correctly understand the instrument statement which the American company issues each month. This statement in reality represents every instrument in use, including switchboard telephones and dead heads, and official telephone and many furnished at reduced rates. Two instruments are reported for each subscriber.

"On January 1, 1903, the company reported connected 1,277,583 telephone subscribers, and in the hands of licensees 3,150,320 instruments, but the subscribers using two each would utilize 2,555,976 of these instruments, showing 594,344 instruments not used by subscribers, or over 18 per cent of the total amount outstanding. Most of these are probably subscribers' extension sets.

"Another large item in connection with the business not usually taken into consideration, is the fact that in order to gain the use of 515,262 instruments, the net gain this year to date, the company had to put out 923,978 and take back 408,716. It has always been the experience of the license companies that in order to gain one subscriber they must put in two and take out one."

The above is a clear presentation of some pessimistic talk heard in a few quarters regarding Bell telephone shares, now that they have declined more than fifty points, or at about the same ratio as New York Central and Pennsylvania. The talk heard against Pennsylvania is that it is spending too much money; against New York Central, that it has got to spend too much money; and against Telephone that it can never stop spending money.

A gentleman who has studied this question of railroad and telephone construction very carefully, cannot conclude otherwise than that railroad construction to make one first-class line is better than railroad duplication to make two poor and competing lines, and holds the same principle as respects telephone investment. He believes in holding the Bell Telephone company to the highest standard, and does not believe in wasting the money of the public in weak attempts at competition. He does, however, hold that the public must pay a fair price for a quasi-public service like that of the telephone, to enable the company to maintain the highest uniform efficiency.

It is estimated that it will take five years to bring the telephone field in the United States to the point of saturation, as has been done in case of electric roads and electric lights.

The one and only great unsolved problem in the telephone field to-day is concerning the changes in telephone installations. In the new fields three telephones must go in where only one or two remain.

It is certain that the tendency of telephone rates in this country is not downward, because the tendency is continually to increase the burden and work of the telephone. In some places, a few years ago, a telephone operator could attend to the calls of 75 or 100 subscribers; now, the same operator can attend only to the needs of twenty-five subscribers, and in some places the calls of less than ten subscribers have to be grouped together under one operator for proper attention. More than $200,000,000 of money has gone into telephone construction under the Bell Telephone system in the United States, and where $5,000,000 and $10,000,000 were formerly raised in New England for this construction, $30,000,000 should now be raised.

Another experienced telephone man says: "It costs $15 per annum for maintenance or depreciation for every telephone subscriber in the United States. This means nearly $20,000,000 per annum for telephone maintenance alone.

"Fifteen dollars per annum is a very small depreciation and maintenance charge against a $200 investment which I figure every telephone subscriber represents to a Bell Telephone share investor.

"Anybody can figure that more than $200,000,000 has gone into the Bell Telephone field of this country, and there are not yet 1,500,000 telephone subscribers, so that the actual cost per subscriber in the Bell Telephone field is pretty accurately represented by the capitalization (stock and debt) of the sub-companies, as bonds and stock are sold at par to stockholders to raise new capital.

"I have just figured the capitalization per subscriber in eight Bell Telephone companies, and the figure ranged from $209 to $241 per subscriber. Fifteen dollars per annum for maintenance and depreciation for each subscriber is, I think, none too high."

In further comment we might say we have no doubt that the American Telephone and Telegraph company requires thirty millions of dollars of new money each year, but we doubt very much whether it is needed for the demands of its growing business.

There is one statement in the article, however, which is remarkable, in view of the context, by reason of its truth. That is the sentence regarding Independents, "who are pressing the big company hard at some western points." It would be unkind to say that the "some western points" mentioned include practically everything west of New England and east of the Pacific ocean. An inspection of a telephone map would, however, shed further light on the "some western points." Western investors are to be congratulated on the fact that according to this inspired statement they will not be expected to contribute toward further purchases of stock in the Bell company, as New England is expected to furnish practically all of the new money for the future. Might not a dispassionate observer ask why it is that New England has to be the source of supply for money to be spent in the West? It would seem as if that very admission proves conclusively that upon the ground where the fight is going on between Bell and Independent, the Bell company has no financial support. Surely where the money is being spent should be the best place to finance the investment. Is it not a stinging rebuke to Bell methods, and the strongest kind of an indictment against Bell prospects, that it cannot raise money on the ground where it is to be spent, but has to go to far New England, living in practically benighted ignorance of Independent telephony, for the new money which it needs? We venture to say that even in New England it would be difficult to raise money for Bell enterprises in any locality where there is a prosperous Independent exchange. The lesson should be obvious to anyone.

Another remarkable statement in the article above quoted is, "The Bell companies to-day are giving too good a service for the money received." For daring audacity of prevarication this surpasses anything dreamed of by Ananias in his wildest ecstasies of lying.

A little further on in the statement appears the suggestion, "there are few people who correctly understand the instrument statement which the American Telephone and Telegraph Company issues every month." We must admit that that is true. There are few people who can understand any sort of a statement issued by the Bell company, because such statements are notoriously "fixed" and "doctored" to meet the needs of the hour.

A humorous side light also is given in the paragraph, "It is estimated that it will take five years to bring the telephone field in the United States to the point of saturation." What a marvelous faith in the capacity of the sponges! For surely this sentence cannot be construed in any other meaning than that we are to have more water for Bell company stock. We have not noticed that the Bell company here in the West is saturating any particular localities with an over abundance of new telephone installations.

Did space permit we could further analyze this remarkable production of the Bell financial publication department,

but it is impossible to do anything but laugh over the remaining absurdities of this statement. We would suggest for careful thought, however, the statement that Bell telephones are capitalized at a figure ranging from $209 to $241 per subscriber, and that Bell maintenance and depreciation charges are figured at $15.00 an instrument per annum. So long as the Bell company pursues this fatuous method it cannot be regarded seriously as a competitor.

Independents desirous of selling their securities to the investing public can put forth no better argument than that presented by the Bell figures, which show the enormous expenses and over capitalization per telephone and also show its enormous expense ratio. In the earlier days of Independent telephony it would have been possible to advance the argument that Independent figures were only theory, and that Bell figures were indisputable facts. There are, however, at the present time too many successful Independent telephone exchanges which have proved conclusively the fallacy of Bell figures, either as to original cost or operating expense.

A happy New Year to brother Independents, and happier by reason of the fact that we no longer have a vigorous man to fight. The Bell company is trembling on in its dotage, and its utterings are but the garrulous whimperings of a sorely disappointed old man in his second childhood reveling in remembrance of the past, and with eyes glazed to his inevitable future fate.

The telephone system ministers to the needs of civilization in lengthening the potent life of mankind by the utilization of time.

THE LINE OF DEMARCATION.

"Are our telephone periodicals sufficiently careful as to the business relations sustained by contributors?"

What a smooth idea it was on the part of the Bell to have the "Assistant to the General Manager" point the moral to the ultimate downfall of all Independents, by deductions drawn from English statistics, and to promulgate pernicious Bell doctrines under the guise of "discussions." Too wise to openly attack the Independents, it endeavors to accomplish the same ends by "educational methods" that, read between lines, must prove the most powerful deterrent yet devised for driving capital far from the telephone field.

In 1898 Mr. Bennett installed an Independent plant in Guernsey, and here are the comments of the editor of the *American Telephone Journal* on the financial statement issued:

"The Guernsey States Telephone Department, whose figures are now published, was established some years ago, with Mr. Bennett's assistance, to enable the islanders to throw off the sway of the National (Bell) Telephone Company. . . .The Guernsey system is a small system in a quiet place of little commercial activity, and is beset with few or none of the troublous conditions that telephone managers in most towns in this country have to contend with. . . . The total number of lines in service was 881 . . . the traffic produced an average annual revenue per line of just under $15, and on this very modest revenue Mr. Bennett shows a profit, after paying working expenses, interest and postoffice royalty and putting aside for reserve an amount equal to 10 per cent of the capital outlay . . . such matters are largely questions of bookkeeping *versus facts and common sense.* When one desires to make a good showing, one says, for instance, that the plant cost so much and averages so much per line, although, as a matter of fact a considerable additional sum is locked up in items that form as much a part of the plant investment as the wires, telephones and switchboards themselves."

As a man's heart, so are his words. And this Bell-editor, posing as an Independent, tells his readers that "such matters are largely questions of bookkeeping versus facts and common sense." Just as though the Bell had a monopoly of "facts and common sense." This alleged friend of the Independents continues:

"If the Guernsey States Telephone Department allowed the not too conservative average of 10 per cent for depreciation on its plant, taken as a whole, the look of the balance sheet would of course be destroyed. But it is questionable whether it is not better policy to face a deficit and try to put the business on a proper basis than to give currency to the delusion that 4 per cent is a proper allowance for depreciation on a telephone system. . . . As a warning to telephone managers to fix proper rates, to deal fairly with investments and charges and conservatively, even generously, with depreciation, the above extracts from the Guernsey reports and the accompanying comments thereon may be of some value."

"As a warning to telephone managers" to be on the lookout for circulars issued by the local licensees of the Bell company containing the entire editorial in question, "copied from the leading journal of the Independents," the "accompanying comments may be of some value."

In other words, the financial report of the Guernsey company, though an admirable one from every point of view, is, in the opinion of Mr. Bell-editor, only worthy of ridicule, because it proved that telephone service could be supplied to about 900 subscribers for an average rate of $15, in direct competition with the Bell.

Flat rates are the rock on which the whole Independent movement rests. Yet the Bell-editor of the *American Telephone Journal* believes, as we showed in December TELEPHONY, that "the flat rate for telephone systems of any size is wrong in principle and fatal in application, . . . is unnatural and incorrect." And he also believes that "to tie himself to a uniform charge regarding distance (in cities) is a dangerous thing for a telephone manager to do." He says:

"The dangerous and insidious feature of the distance element—the miles in the minute-mile unit—is that it will steadily and inevitably grow, both because of the natural growth of the city and consequent increase of area to be served, and because of the growth of the system and increase of the telephone habit, all of which causes will tend gradually to increase the average distance traversed by the local telephone message. . . The growth of cities will naturally be accompanied by an increase in the use of the telephone service; indeed, as every telephone man knows, the use of the telephone service is increasing in far greater ratio than the increase in area and population of the cities. Therefore a charge per message based on a uniform rate for messages traversing any distance contains, it is plain, the same element of danger that the flat-rate itself contains. There is always the risk ahead that by reason of the gradual but sure increase in the distance traversed by the average message the cost of furnishing that average message will overtake, or, at least for profitable ends, too closely approach the revenue obtainable from it. A few weeks ago the *American Telephone Journal* published an account of the experiences of the Maryland Telephone & Telegraph Company, as related by Mr. Bouton, the president of the company, in attempting to furnish service in Baltimore at a flat rate. Mr. Bouton had found that the expense per subscriber of furnishing service in Baltimore was far greater than in a small exchange, and attributed this result to the large traffic of his Baltimore subscribers. Broadly speaking, he was perfectly correct, but he did not go deep enough, as his real trouble is that his Baltimore subscribers use not merely more messages than they pay for, but more *minute-miles,* and under a flat rate the number of minute-miles used by each subscriber in a large and growing system is certain constantly to increase. In time the average consumption of minute-miles will overtake any reasonable flat rate that may be fixed, and, of course, as demonstrated in the case of Baltimore, it will very quickly overtake a flat rate that has been fixed at an unreasonably low figure in the first place.

"Now, granted that the basing of the unit charge per message on the assumption of an average distance for each message is dangerous, on the ground that the average miles per message will surely grow, how are we going to get around the difficulty and guard against the danger of our cost per message overtaking our revenue per message in the same way that under flat rates our cost per subscriber overtakes our revenue per subscriber?"

Now all that sounds very reasonable and is logical from the editor's point of view. And, by reason of the attractive circular form in which it is presented to capital, will entice many to take that view of the telephone problem. But where does loyalty to the Independents come in? And are Independent principles to be so basely betrayed? If that editor is right, what becomes of investments in the Independent field?

In its issue of September 19, 1903, the *American Tele-*

phone Journal has an editorial bearing the caption, "The Correct Way to Talk," that contains some sensible suggestions to all users of telephone service. But it also contains a statement that could easily be construed to mean that the only transmitters in use in the United States are the Blake's and solid-backs of the Bell. This is only a straw. But it clearly illustrates that, in the opinion of the editor of the *American Telephone Journal,* "the correct way to talk" is with Bell solid-back transmitters.

"In the old bygone days of the Blake transmitter, such instructions were not so far out of place, because if the lips of the speaker were too close to the diaphragms and the voice was unduly raised, the puffs of the breath impinged upon the diaphragm, and as there was but a single contact, set it vibrating in an improper manner, so that the hearing at the far end of the line was seriously interfered with. But in these modern days of improved solid backs and granular buttons the preceding instructions are the most erroneous that could be given. In the solid back transmitter the rear electrode is mounted upon an anvil, and it is impossible to set it vibrating after the fashion of the duly respected Blake platinum contact. We have always understood that British telephony was considerably behind the art here in our own country. Therefore it is quite possible *Electricity* still uses a Blake transmitter, and thus is advising its friends in all good faith from an experience that is limited to an instrument that, while in its time, it faithfully performed its service, is in this country entirely obsolete and relegated with other relics to the scrap heap. We must, therefore, make due allowances for the ancient equipment possessed by our friends across the water."

Do Independents illustrate their arguments with references only to Bell equipment? And are Blake transmitters the only kind "possessed by our friends across the water"?

We are unable to say whether the editor of the *American Telephone Journal* is carried on the pay roll of the National (Bell) Telephone Company of London. But, if not, he is certainly doing all he can to injure the financial integrity of the competition the Bell is facing across the water. In its issue of November 21, 1903, this Bell-editor gleefully joins in "pouring hot shot into the telephone accounts and methods of the Glasgow corporation."

"The omission of any allowance for depreciation is condemned (by *Engineering*) in the most wholesale way and the Glasgow Council is reproached with following a 'dangerous and foolish policy' in financial matters. The trouble is, thinks *Engineering,* that if depreciation were paid there would be no 'surplus' to carry forward, and the citizens would see the telephone enterprise as it really is—a concern carried on at a loss to the community for the benefit of some 9,000 citizens who get telephones at unprofitable rates, and for the glorification of the local authority. This is rather straight talk, but there is some straighter still, which we will quote in full."

Was there ever so insidious an enemy to Independent progress as this Bell-editor? By reason of the personal element and the support of the manufacturers, he does not dare to write in that fashion about competitors to the Bell in the United States. Nevertheless, in the pages of an alleged Independent journal he conveys to capital the statement that if the accounts of that competitor of the Bell were properly audited "the citizens would see the telephone enterprise as it really is—*a concern carried on at a loss to the community* for the benefit of some 9,000 citizens who get telephones at unprofitable rates." No wonder the Bell is circulating these editorials in Evansville and winning converts every day, and is being ably assisted by manufacturers of Independent apparatus and supply dealers who unconsciously contribute to support a publication whose editor is the "Assistant to the General Manager."

For three years the *American Telephone Journal* has been just what it is to-day. No more, no less. When Mr. John I. Sabin was elected to the presidency of the Central Union Telephone Company for the express purpose of wiping out the Independent movement in Ohio, Indiana and Illinois, did the *American Telephone Journal* guard the interests of the Independent fraternity? Or did it clearly show where its interests lay? In its issue of July 11, 1901, the editor of the *American Telephone Journal* clearly states his position:

"We agree with the assertion of Mr. Sabin that the territory of the Central Union instead of having 70,000 stations only, should have 300,000. We fancy, however, that he has underestimated the possibilities of the case. The population of the territory is something over 15,000,000, and if Mr. Sabin's dreams are realized, that would mean a telephone to every 50 persons. At present the ratio is 1 to about every 200 of population, which is absurd in the highest degree. But President Sabin is a practical man who knows from experience that a colossal telephone system cannot be built up in a day even in this prosperous country. Hence 300,000, or one to fifty, would satisfy him for the present. Such a proportion would put the Central Union on a paying basis and then John I. Sabin, the great organizer, par excellence, could come East or go South and assist other great subsidiary companies of the Bell to pay dividends on a generous scale. Charles J. Glidden failed to do this as respects the Erie, but Mr. Sabin may try his hand.

"Now, we are interested in the development of the telephone itself and in the rivalry and competition of the various companies who are employed in the business and, incidentally, in making money for themselves. And, therefore, we ask this question: If the States of Illinois, Ohio, Indiana and Iowa should have 300,000 telephone stations what about the States of New York, Pennsylvania and New Jersey with their 16,000,000 of population? . . . President Sabin is the Napoleon of Bell telephone organizers and from his central office in Chicago he is issuing commands to reduce prices where competition is found; he is covering his territory with slot machines; he is sending solicitors all over the land. He realizes that the merchant and business man and the resident will not, as a rule, come to him for a 'phone, and so, clever man that he is, he is going to them."

What better advertisement could the Bell have desired? And could an open Bell journal portrayed the Bell side more clearly? And could the *American Telephone Journal* have defined its own position more clearly than in saying: "We are interested in the development of the telephone itself and in the rivalry and competition of the various companies who are employed in the business"?

The telephone is as much a necessary part of the commercial machinery as the railroad, the mail or the telephone.

A REQUEST.

It is the purpose of TELEPHONY to publish each issue such articles as will appeal to the greatest possible number of telephone men. To this end we ask that each one interested in Independent telephony write us as to the class of matter he considers of most interest. Of course we know opinions will differ as to what should or should not be published, but we believe that from the letters received we can form an idea of what kind of telephone literature is wanted. We have mapped out a strong publication for the present year. The most pertinent and interesting telephone subjects will be handled by the world's greatest writers. We will be fair and fearless in our editorials and our readers may be assured of our *independence* always. There is only one TELEPHONY. It has always been foremost in fighting the battles of Independents and has become the national authority on everything pertaining to the industry. Its strength lies in the loyalty of its readers and it is to the readers we appeal for an expression of opinion as to how we can best serve them. TELEPHONY is of the people and for the people. *Truthful, fearless* and *Independent.*

When the average layman attempts to investigate any one part of electrical science, he is at once confronted with such an array of technical considerations that he is fairly bewildered and hopelessly at sea; and so it is when we look through the columns of TELEPHONY, Chicago, Ill., for there we get glimpses of what this one branch means and the intelligent work that is absolutely necessary in editing and carrying on the workings of such a magazine.—*Trade Press List, Boston.*

Herewith please find $1 for my subscription to TELEPHONY. I take pleasure in congratulating you on your publication. The fearlessness, fairness and ability with which it is edited should commend it to all persons interested in telephones or telephone exchanges.—Charles E. Hellier, New York City.

We have a contract with a press agency to furnish means of telegraphic communication between two large cities about seventy miles apart. Unfortunately, only one telephone line is available and this breaks at an intermediate exchange, which fact is necessary, as the intermediate town does the greater part of the telephone business. We have used a circuit, as is shown in Fig. 1, composed of balanced bridged impedances of 300 ohms each, and middle points attached to the telegraph instruments with their respective keys and sounders. The circuit in Fig. 1 works perfectly and only requires a ringing generator that is not grounded. We get around

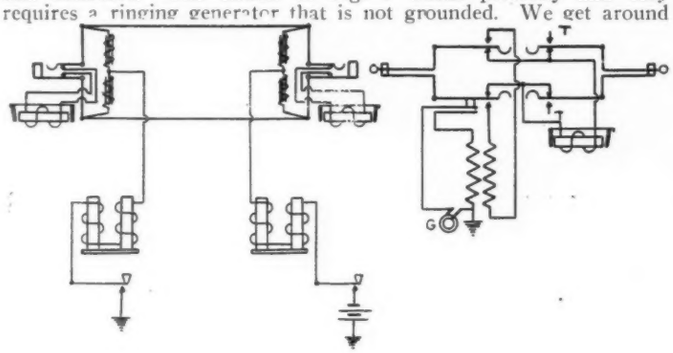


FIG. 1.

this by putting a repeating coil in the ringing circuit of the toll operator, as nearly all genrators are grounded. In Fig. 2 is shown the telegraph apparatus at *X* and *Z* with 300 ohm impedances connecting the sides of the lines at the *Y* exchange. But for some reason, when a party at *X* is talking to a party at *Y*, and a party at *Y* is talking to a party at *Z*, there is a great deal of cross talk between the separate toll circuits and it makes our toll service unsatisfactory. I always thought that a coil with a core of iron would prevent cross talk between circuits. Tell us what is wrong and how to remedy the trouble.—A. R. C.

It looks reasonable to think that the 300 ohm impedances at *Y* would serve to prevent cross talk. The chances are, however, that the 300 ohm impedances have a small amount of iron and offer very small impedance as regards voice currents. Cross talk would consequently result and there would also be a tendency to wrong ringing effects. For instance, suppose that *X* rings *Y*, and the drop falls. Does it not look reasonable that the drop on the line from *Y* to *Z* will fall if *Y* will fall, and the drop at *Z* also? This would cause a great deal of confusion. It is bad practice to have lines in such relation. I would suggest the method shown in Fig. 3, in which each line is entirely separate except at the middle points, which are strapped together. The instruments are placed at *X* and *Z* and one could be placed at *Y* if desired. This circuit should be adapted to plugs and jacks, so that at times when the telegraph attachment is not in use, it could be pulled down by the operator and be just as easily put back. The chances are that such a telegraph line would be in use all the time. There is no reason why telephone companies cannot more generally indulge in this class of work. The income from such a source is all "velvet." In this connection I want to call attention to the necessity of a generator without ground, because such a generator plays havoc with the telegraph instruments. Such a key as is shown in Fig. 2, with the two extra contacts is a commercial key and serves the double purpose of closing generator through primary windings and the secondary on key proper.

The C—— Street Railway Company has very recently installed a three phase, high tension system using 13,200 volts, to operate all the city lines and three interurban lines, one of which terminates at A——, a distance of twenty-three miles. There are two sub-stations on this line, five and sixteen miles from the power house. At these stations three wires lead into a building into what is called a rotary transformer in which the 900 volt alternating current enters the transformer and leaves it as 500 volt continuous current.

(1) What I wish to understand is how the three transformers are connected and built that transform 13,200 volts, or 4,400 in each wire, to 900 volts, or 300 in each wire which drives the rotary transformer.

(2) What is the difference between alternating current of the ordinary kind, and that of one, two, three, and polyphase systems?

(3) What is the difference between a three phase generator and the ordinary alternating current generator, and why does it require three wires equidistant on the lead?

This lead, carrying the 13,200 volt wires and the trolley wires, parallels our telephone lead for five miles, the telephone lead on one side of the road and the high tension wires on the other side,

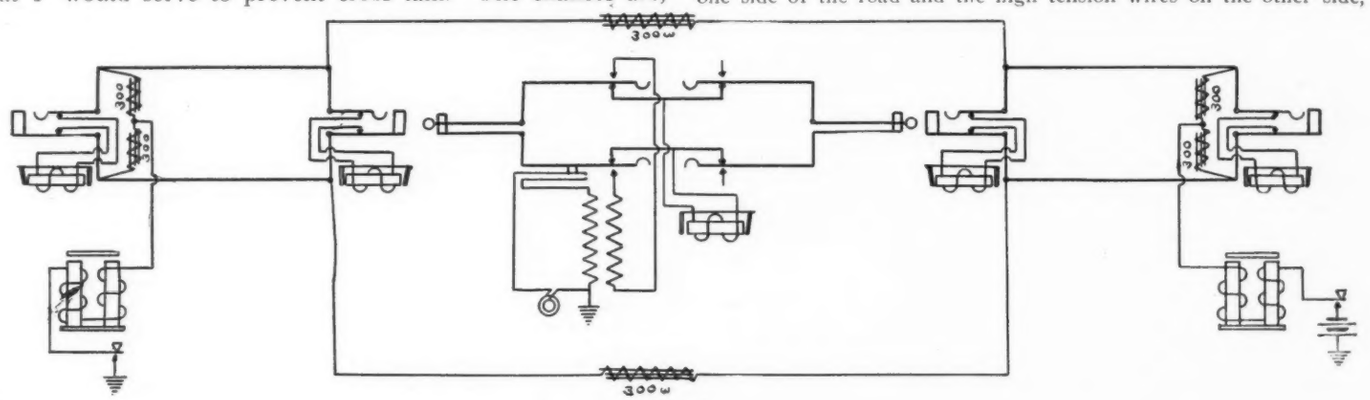


FIG. 2.

fifty feet away. For one-third of the distance the trolley line is in the middle of the road while the other two-thirds of the distance the trolley is suspended to the lead by brackets. Ever since the line has been in operation we have more or less noise on every circuit on the lead, especially so on the three toll circuits. One toll circuit is a very poor one to commence with. It was built of second hand wire, different sizes, ranging from No. 6, No. 9 to No. 12 iron for the first five miles directly paralleling the high tension wires. The other circuits are copper No. 12, and are comparatively quiet until there is a car on the five mile stretch—then the "howl" commences. The one that gives the most trouble is the assorted wire line. I realize that it is foolhardy to construct such a line, but the remuner-

ation from it would not justify any additional expense; so the question is—

(4) How can it be brought up to near commercial standard without additional expense?

At first the noise due to running cars was very great. We cut in transpositions every quarter of a mile, which helped it a little. Then we found that there were a great many bad joints and had them "jumpered" with No. 14 copper wire. All these things helped, but the line is still bad. At times the line is quiet and we get good transmission, but on the whole the line is not what it should be. I should add that at the five mile point the lines all lead away from the disturbing influence of the disturbing high tension circuit into a part of the country where no foreign currents exist.

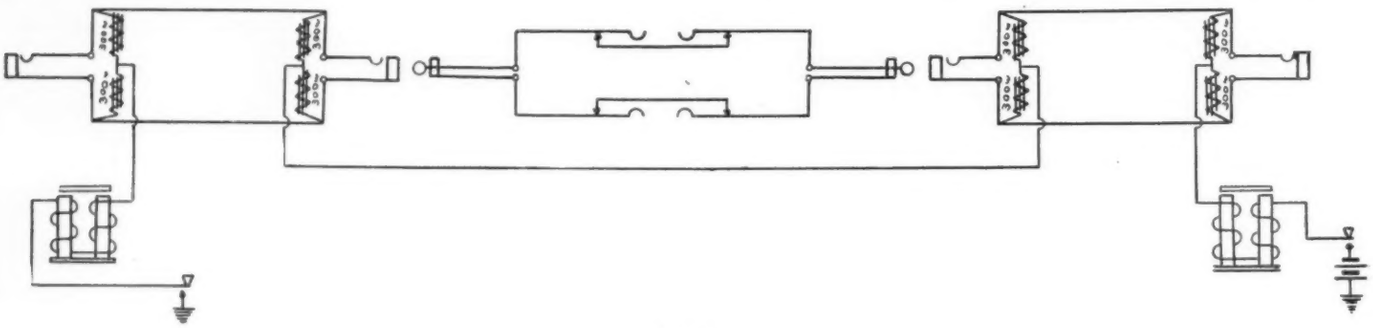


FIG. 3.

The circuits are all transposed, according to Bell specifications, with no reference to their respective pin numbers on the lead. Have made a sketch, shown in Fig. 4, of the lay of the conditions.—E. A. B.

Question No. 4 is the most important from the telephone operator's standpoint and will be answered first. Although the ever increasing mileage of interurban lines will soon convince every telephone man that in order to successfully combat the ruinous effects of induction, he must understand the nature of the railway currents. There seems to be no question as to the cause of noise on one of the toll circuits.

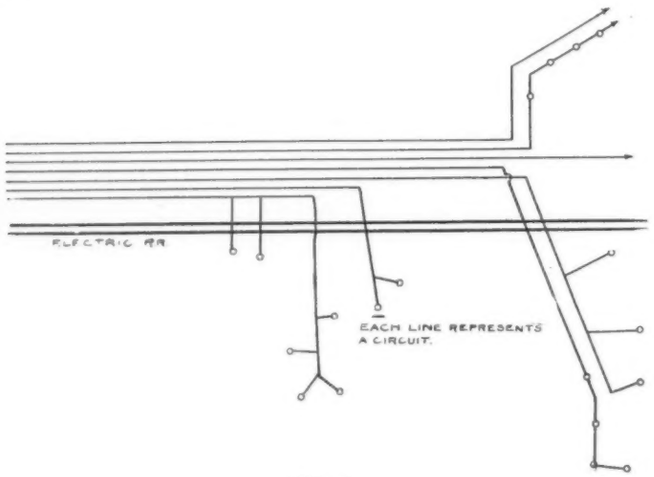


FIG. 4.

It is clearly an unbalanced circuit, and if all the bad joints had copper wire jumpers, however well soldered, the balancing of such a line would be only accidental. The numerous transpositions of a line would be only accidental. The numerous transpositions of a line will do no good, unless each side of the metallic circuit offers equal receptive or resisting conditions to the disturbing circuit. In this case, the induction comes from the trolley wire and feeder, and not necessarily from the high tension wires. It would do no good to transpose for the first five miles if the lines were unbalanced beyond the point of paralleling. The necessity of perfect balance cannot be too strongly impressed. The line as a whole must always be considered. If the noisy toll line had scraps of wires for its circuits along the path of the trolley line, it is safe to say that the line as a whole is of the same construction. Therefore it would do no good to partially repair such a line. The incentive for the bad construction on account of small income of the line is wrong. It has cost more to repair that line, and keep it in order than it would have been to put in copper in the first place, and every exchange operator who has to contend with the trolley proposition will find that his lines must be absolutely balanced, whether it parallels the trolley twenty feet or five miles. And it makes no difference whether the lead is across the street or even perpendicular to the trolley, for the trolley wire and feeder will cause trouble on any telephone line that shows the least unbalance whatever the conditions of proximity. I will say that no amount of money will bring a bad line up to standard, because it cannot be balanced. A new line, thoroughly transposed and balanced, clear to the farthermost terminal, is the only guarantee of a standard operation. Cut the old line down. There is hope of the other lines, as they are of a single sized copper, and the chances are that a balance can be attained.

There is no indication from the three phase high tension line, if it is a balanced circuit; that is if it has an equal amount of energy in each leg of the circuit. Should one of the wires of the three phase break and fall to the ground, your telephone wires in the vicinity would be raised in potential to 58 per cent of 13,200 volts, or 7,650 volts. As it is impossible to insulate telephone lines to even stand a potential of 1,000 volts, it looks reasonable that a charge on your telephone lines of 7,650 volts would break down the insulation somewhere and go to earth. A grounded line is noisy, and this kind of a ground would be extremely noisy. This trouble only happens accidentally, for the trolley people usually put up good lines and they hardly ever break. But if they do break, you will get an electrostatic potential induced in your lines which will be sure to break them down. Why is this amount 58 per cent? I hear some ask. It is because there exists between the wires of a three phase circuit a voltage equal to the total amount divided by the square root of three. If the circuit is two phase, there exists a voltage equal to the square root of two. And if four phase, it would be the square root of four, or one divided by two, or one-half. One divided by the square root of three is .58. so if the total voltage is 13,200, there exists in each leg, or between each pair of wires, 58 per cent of the entire voltage, or 7,650 volts.

The three wires leading to the rotary transformer have 7,650 volts in each leg. This is transformed by the ordinary high tension single phase transformer to 370 volts total, which passing through the rotary, gives current to the trolley line at 500 volts continuous pressure.

Ordinary alternating current is called single phase, because the one current rises and falls as the single coil armature passes the positive and negative poles. Two phase alternating current is generated by an armature carrying two coils, so that in passing a positive and negative pole, two separate currents rise and fall. Likewise, a three phase current is generated by three coils on the armature core, each coil occupying 120 degrees space. It is like three machines

throwing alternating current on to one circuit, just 120 degrees apart. This explanation is not a very good one, and I would suggest the purchase of a very complete book, by Professor Jackson, entitled "Elementary Electricity and Magnetism." It deals in explanations by analogies and should be in possession of every electrical man.

The difference between ordinary transformer and three phase transformer connection is shown in Figs. 6 and 7.

In the last number of TELEPHONY some one asks what to call a message sent by telephone. I would suggest the word "telephem." Would like diagrams, showing the best way to connect two 100 subscriber sections together to make one operator's position, and also to make two by a switch.—J. S. B.

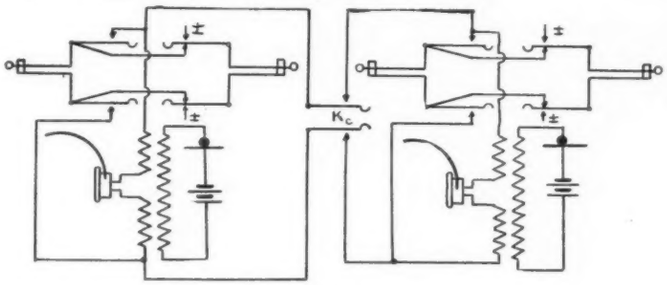


FIG. 5.

According to Fig. 5, there are two operators' positions, each being assumed to act for fifteen pairs of cords. In each keyboard there are two wires common to the outer key contacts, called listening strap wires. These two communicate with the induction coil secondary. It is also assumed that you use a jack which closes the transmitter circuit only when the receiver plug is inserted. Between the strap wire pairs of each position is an ordinary key, normal-

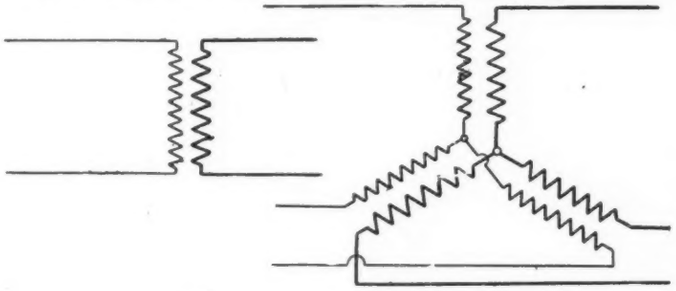


FIG. 6.

FIG. 7.

ly open. When either operator leaves her position, the closing of the key will throw the two positions together. Removing the receiver from the jack makes no difference, only the operators should adopt that habit and thereby save battery current. This connecting key should be mounted directly between the operators, so that it may be of easy access. As you have no busy test, I can see no complications coming from the simple use of the key.

In the November TELEPHONY you refer to finding trouble in underground cables by means of an exploring coil and receiver. Please explain what size coil would be necessary to use. Give size of wire and resistance necessary. Also if core or primary winding is necessary and if the coil should be held at right angles or parallel to the cable. Also what would be best for locating point of trouble in overhead cables after trouble had been located as closely as possible with galvanometer.—O. T. Co.

After finding approximate location of trouble in overhead trouble, and not being certain, a man should ride over the cable and examine the sheath closely. Cable trouble generally comes from some plain sheath trouble, such as a crack, or small bullet hole, etc. However, trouble should be located close enough to the seat of the disturbance that an inspection should be a short job.

In regard to the exploring coil, it will find open places in a cable, but such cases are a rarity. Such a coil should have very fine wire, say, 36 or 40, and resistance running up to 500 ohms or more. It should be held parallel to the cable. No iron core is necessary, although there are certain types of repeating coils that make excellent explorers. It should be one without a sheath.

We have a copper return magneto system, Kellogg switchboard, in frame building, office up stairs, with incandescent wires above operator and below her in the floor beneath. Induction is very bad. Even with cam closed and no plugs in use, a buzzing sound is heard in the receiver. This can be stopped by the operator or person standing near her by touching transmitter or other metallic part of switchboard. If binding posts on receiver touch the operator's fact, a sharp buzzing sensation is felt, and operator complains that the receiver is hot. The following experiments were tried: Wire connected to common return, which, touched by the operator, caused sound in receiver to cease. Drawn lightly over back of head a burning sensation was felt. Touched to stove, small sparks were seen. When operator with receiver in place walks behind switchboard, sound nearly ceases. If she walks back the length of the receiver cord, the noise is worse.—E. O. C. Co.

This certainly indicates a peculiar phenomenon, but there seems to be some inconsistencies in the behavior of different actions. There could be an electrostatic induction from the incandescent wires, enough to make a good noise, but I do not understand how a shock can be obtained without actual contact with the incandescent mains. I would like to know if the receiver and listening parts were well insulated from everything before expressing any opinion. I leave the question open to the readers, with the hope that they find interest enough to enter into the discussion.

Odds and Ends.

A series of experiments carried out in the German navy has proved the possibility of telephoning without wires, messages being successfully transmitted a distance of five miles or more. The method employed is to insert an exceedingly sensitive microphone in the circuit of an electric searchlight. When this is spoken into, the waves of sound affect the electric current causing it to vary in intensity, and these variations are repeated in the searchlight. At the receiving station is a concave mirror containing a cell of selenium, a non-metallic element, which exhibits under the action of light a remarkable variation in electric conductivity. The selenium is connected with a telephone receiver, and the rays of the searchlight being caught in the mirror, the variations in the intensity of light are converted again into electric variations, which in the receiver are reproduced as sounds, as is the case with the ordinary telephone.

Nathan Stubblefield, the Murray, Kentucky, inventor, who claims to have made some wonderful inventions, and claimed a few years ago to have invented a perpetual motion machine, comes to the front again by the following card in the Murray Ledger, which explains itself:

PUBLIC NOTICE.

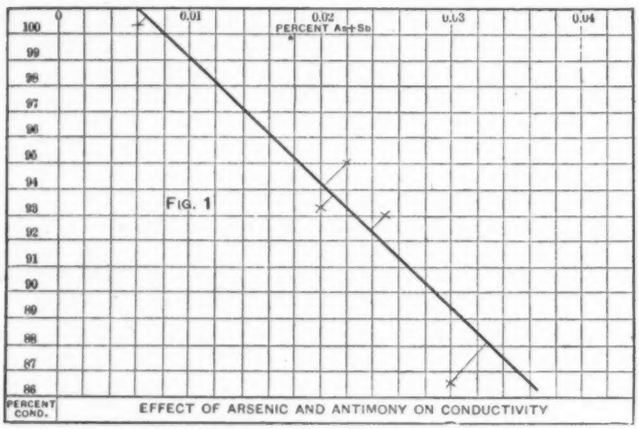
The Wireless Telephone Company of America, organized for the development of my inventions has gone out of existence, Gerald M. Fennell, the promoter, has gone to Europe. My inventions have reverted back to me, the essentials unknown to my colleagues. Out of something over two thousand dollars paid me by the promoter before transfer to the company, I have been able to very much develop my inventions, which are soon to be exploited under quite a different management. Fennell proved unreliable, hence this notice and statement, showing to the public "why all this delay."

—Nathan Stubblefield.

Electrical Conductivity of Commercial Copper

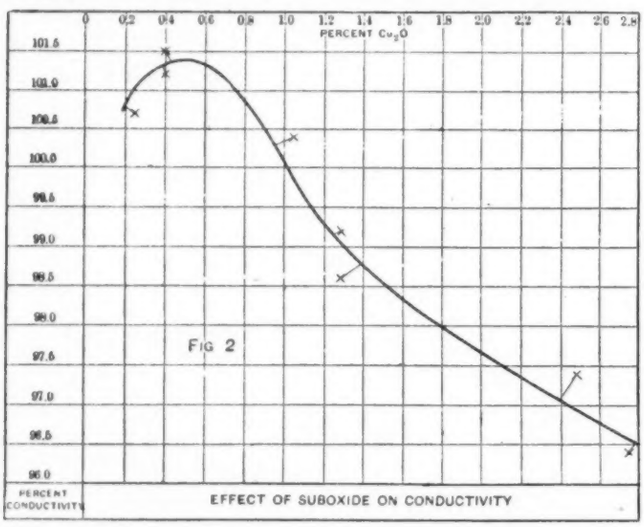
A Paper read by LAWRENCE ADDICKS before the American Institute of Electrical Engineers, New York.

Electrical conductivity has come to be a universally accepted measure of the degree of purity of copper for two reasons: First, on account of the enormous quantities of copper used in electrical construction; secondly, because the conductivity forms a very delicate test of the chemical purity of the metal. Furthermore, a conductivity test may be made upon a wire of suitable dimensions in about three



minutes, while a chemical analysis of refined copper is a tedious and correspondingly expensive operation.

Matthiessen's standard (one metre-gramme of pure soft copper at 0° Centigrade = 0.14172 international ohms), has come into very general use, although it is some three per cent too low. The fact that the quality of the copper on the market to-day often exceeds by as much as one per cent the purest laboratory copper of forty years ago forms an interesting commentary on the excellence of modern methods.

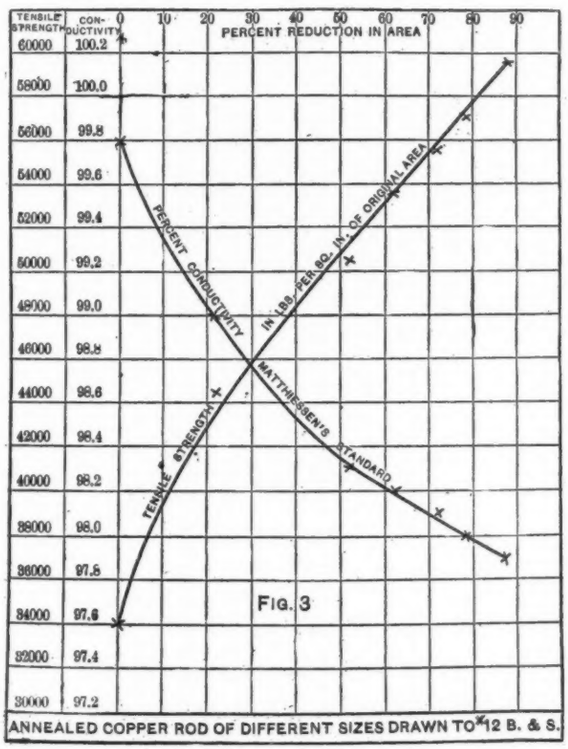


Conductivity is affected by the physical state of a metal or alloy as well as by its chemical constitution. Now in order to obtain the sample of wire upon which a measurement is made, the copper under examination must be subjected to several mechanical processes, and these different variables must be taken into account. It is the purpose of this paper to point out their influence.

First, let us take the influence of the chemical impurities commonly met with. These consist of oxygen in the form of suboxid of copper, arsenic, antimony, and, in some coppers, bismuth. Small quantities of some other elements, may be met with but those mentioned are the impurities to be looked for in low copper.

The relation between arsenic or antimony and conductivity is shown in Fig. 1. As arsenic and antimony have a very similar influence the data have been gathered as arsenic plus antimony, thereby greatly simplifying the work. The suboxid of copper is practically constant in all these determinations. The conductivity is stated for annealed samples of wire. It will be noticed that one one-hundredth per cent of arsenic or antimony lowers the conductivity about five per cent.

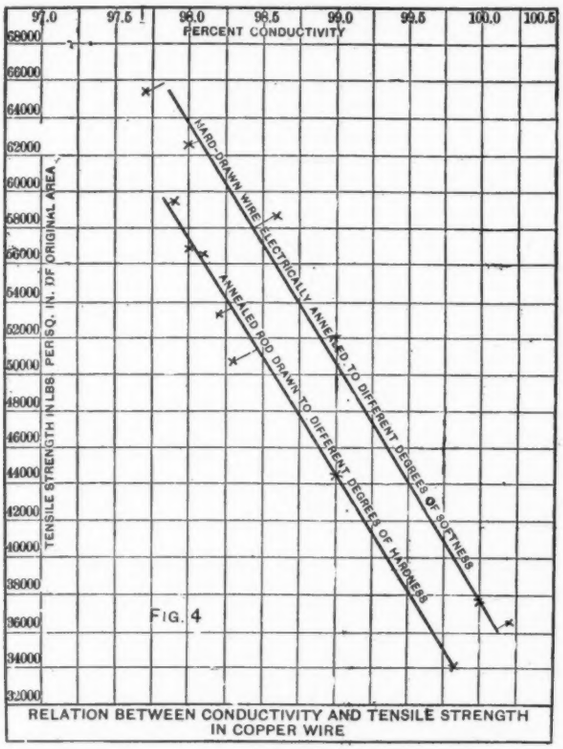
Fig. 2 shows the relation between suboxid and conductivity in annealed wire. The suboxid has been calculated from the oxygen, itself obtained by subtracting the per cent



copper by analysis from 100. The quantity of other impurities present is so small that this is substantially correct. The crest of the curve shows copper "in pitch" or "set" or when sufficient oxygen is retained to keep the impurities as oxids, in which state they are supposed to be less harmful. The possible formation of a carbid or the absorption of hydrocarbon gases from "overpoling" in the refining furnace has also been suggested.

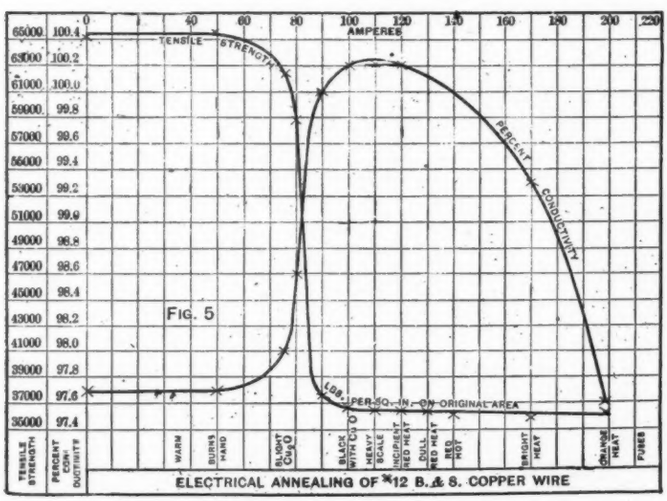
We come now to the physical characteristics and their influence upon the conductivity. We can cause considerable changes in structure by mechanical operations and, as would be expected, the conductivity is affected thereby, but by no means as seriously as by arsenic or antimony. The operation most commonly met with is that of wire drawing—conductivity varies with hardness. In Fig. 3 conductivity and tensile strength are plotted against the percentage reduction in area of a wire rod after annealing and in Fig. 4 conductivity is plotted directly with tensile strength. It will

be seen that the tensile strength varies almost directly as the reduction in area and that the conductivity drops about one-tenth per cent for every one thousand three hundred pounds gain in tensile strength, a fact which must be taken into account when comparing different samples of hard-drawn wire. Fig. 4 also shows results obtained where a


PERCENT CONDUCTIVITY
TENSILE STRENGTH IN LBS. PER SQ. IN. OF ORIGINAL AREA
HARD-DRAWN WIRE ELECTRICALLY ANNEALED TO DIFFERENT DEGREES OF SOFTNESS
ANNEALED ROD DRAWN TO DIFFERENT DEGREES OF HARDNESS
FIG. 4
RELATION BETWEEN CONDUCTIVITY AND TENSILE STRENGTH IN COPPER WIRE

hard-drawn wire is given different degrees of annealing. This ratio, shown by the angle of inclination, of the straight line to the axes, is independent, in so far as the writer's investigations have extended, of the actual conductivity of the annealed wire, which is of course dependent upon chemical purity.

Fig. 5 shows the effect of temperature in the annealing operation. A 12 B. & S. hard-drawn wire has been heated to various temperatures by being forced to carry currents from zero to a fusing current of about 220 amperes. The



actual temperatures were not measured at the time the tests were made. Very roughly the temperature in degrees Fahrenheit will be about ten times the values shown for amperes. In the experiments quoted about ten feet of wire was put in series with a water rheostat and the whole shunted around forty or fifty volts of a 4,000-ampere circuit. The current was adjusted by acidifying the water in the rheostat and was left on in each case until it reached a steady value—a matter of about a minute. The time during which the current was on, after this steady heat was reached, seemed to exert no other effect than to increase the shell of scale formed on the wire.

The question at once arises whether the lower conductivity due to overheating is caused by the absorption of oxygen in some way or to a crystalline change. The first idea that suggested itself was to anneal the wire in such a way that oxygen could not attack it. Handling white-hot wire of the length needed in an atmosphere of nitrogen proved somewhat troublesome, however, and was left as a last resort. Silver-plated wire was tried but the plating would not stand the temperature. Finally the problem was attacked in two different ways: First, samples of burned wire were immersed in dilute nitric acid until the diameter was considerably reduced and then measured for conductivity. No appreciable difference was found, showing that any chemical change was at least uniform throughout the wire; secondly, samples of burned wire were drawn to a smaller size, reannealed properly and then tested. The

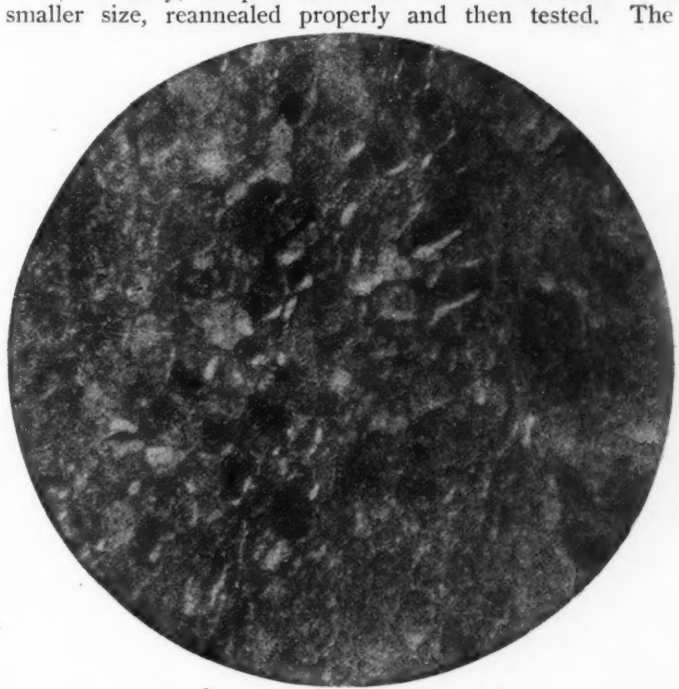


FIG. 6.—GOOD CAST COPPER—×50.

original wire, when properly annealed showed 100.4 per cent conductivity; when burned for the test, 99.1 per cent; and when drawn down and reannealed properly, 100.5 per cent. These results show the change to be of a physical, not chemical nature.

Figs. 6, 7 and 8 are micro-photographs of copper samples which have been polished and etched in fifty per cent aqua regia for about thirty seconds. The magnification and the size of rod from which the samples have been cut are the same in each case. Fig. 6 shows good copper in "set," having a conductivity when drawn and annealed of 99.7 per cent. Pure metals when cast crystallize on cooling into irregular grains the size and distribution of which depend largely upon the size of casting and rate of cooling. When small quantities of impurities are present they form a matrix of what is probably an eutectic alloy of the metal and the impurities, in which the grains of pure metal are set. This is the case with the sample under discussion where the total impurities amount to about one-tenth per cent. Each of these grains is made up of smaller crystals, the cleavage being in different directions in grains. Fig. 7 shows a copper low enough in pitch to give trouble at the drawbench. It is the lowest of the series of points on Fig. 2 and runs 96.4

per cent annealed. The change in structure is at once apparent and accounts for the brittleness developed.

When copper is rolled and drawn this granular structure is broken down, a fine fiber resulting. Fig. 8 shows a sample of trolley wire which has been heated over a gas-blast

FIG. 7.—"LOW" CAST COPPER—×50.

to a bright heat. It shows a partial return to the crystalline state, the matter surface in places having the same appearance as a hard-drawn sample as far as fiber is concerned. This explains the lowering of conductivity by overheating. The writer has never made measurements of the conductivity of cast copper, but understands from work done at one of the wire-mills that it has been found to run about

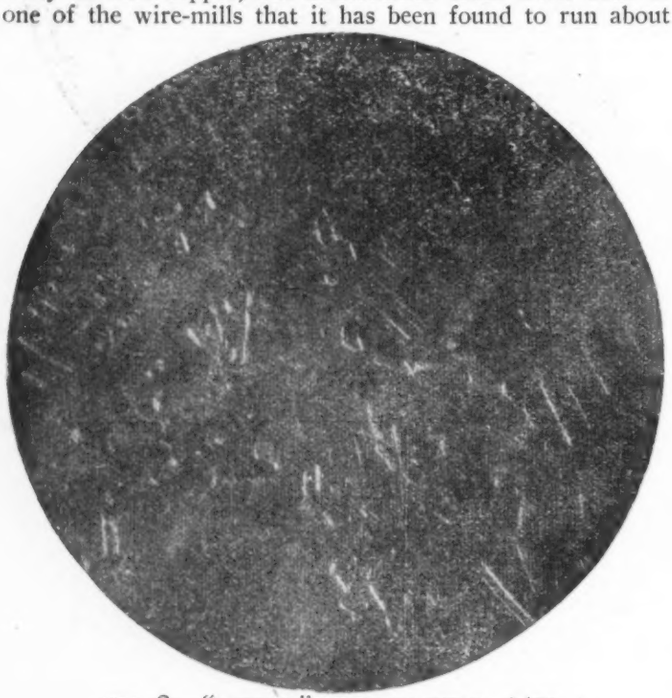


FIG. 8.—"BURNED" TROLLEY WIRE—×50.

3.5 per cent lower than the annealed wire. This is entirely in accord with the data shown above. Copper that has been remelted in the foundry may run but thirty or forty per cent, due to the absorption of gases.

In cast copper we have a conductivity resulting from the combined conductivities of the pure copper grains and the impure matrix or cement. When this is rolled the structure is broken down and the complex shunt and series circuits rearranged to better advantage. When hard-drawn, the molecular freedom is restrained and more work has to be done in the necessary oscillation of an atom in passing a charge on to its neighbor. In annealing, the wire is brought to a temperature at which the cement is softened and all internal strain is equalized. In burning, crystalline growth is started and reverts the metal to the original condition.

WHAT THE TELEPHONE REVEALS.

The telephone reveals one's disposition. It exposes amiability or the opposite traits in a way that leaves one no chance to recover the lost reputation.

Persons who suddenly try to make their voices soft with amiability when they have learned who is speaking never deceive the hearer at the other end of the line. It is the first answer that reveals the person.

One reason for this attitude of mind on the part of the person called is the interruption at the other work. It often happens that he or she may be absorbed in something else. The first tendency is, of course, to answer grufly the person who does intrude at such a juncture. And it takes a certain amount of breeding to compose one's self in order to answer amiably.

Only persons who take the trouble to think of others will make an effort to be polite when they feel in quite another mood. Thus is the telephone at the outset a test of manners.

It exhibits also the natural disposition. Persons who are always amiable and in gentle mood do not show that they are very much upset, even if they feel it, by the sudden ringing of a bell which means that they are required.

The telephone voice may also express one's physical condition as that is indicated by the nerves. Only a few months ago a man who had been for years extremely occupied by his affairs and devoted only to them suddenly broke down, turned out to be a physical wreck, and had to retire from all that remained to him of life. Most of his friends were astonished at this sudden breakdown.

"I knew that he was in a serious condition long before he ever consulted me," his physician said, "and I discovered his condition from his manner of talking over the telephone.

"No man who answered in that irritated, peevish fashion could possibly have been in good health. That voice showed exhausted nerves and physique. So I am not surprised to hear that he has succumbed entirely to overwork."

Thus the telephone is a measure of disposition, manners and health. Its greatest value lies in the fact that it takes a person off guard. The rush to answer the call generally allows little time to prepare one's self; so the real mood shows itself in the first "hello."

Practice, of course, changes all this. Increased frequency in the use of the telephone seems in some cases to have a stimulating effect on the nerves. The patience of the telephone girls who sit at the booths and switchboards is a rebuke to all those who are so emotional as to answer telephone calls in a voice that reveals their characteristics.

BELL PLANT SOLD.

All the lines and poles owned by the Bell Telephone Company in Morrison, Illinois, with the exception of the through toll lines and poles, have been sold to the Farmers' Mutual Telephone Company of Whiteside county. The Bell service will be discontinued, as the exchange of the company was moved recently to the office of the Farmers' Mutual, where operators will have charge of the business of both companies. The farmers have been granted the privilege of stringing their wires on the poles used by the Bell Company.

FRAUD CHARGED AGAINST COMPANY.

The American Telephone & Telegraph Company, in consideration of one dollar, obtained from Sylvester Wilcox a written agreement giving it the right to construct, operate and maintain lines over and along Wilcox's property. The lines were duly erected and the company had taken possession of the property to the extent of operating these lines when an action in ejectment was brought by Wilcox to recover the lands. The company in its defense produced the written agreement giving it the right of entry on the land, signed by Wilcox, who admitted his signature to the instrument, but testified "that at the time of its execution he was told by an agent of the defendant that he had trimmed one of the plaintiff's trees, and wished to pay him a dollar for it, that the agent told him the paper was a receipt for a dollar, that he (the plaintiff) did not read the paper; that he did not have his spectacles with him, and that thereupon, relying on the statement of the agent as to its contents, he signed the paper." The complaint was dismissed by the trial judge on the ground that Wilcox having failed to read the paper was guilty of negligence and could not afterward attack its validity. This judgment was affirmed by the supreme court, and the suit was then carried to the court of appeals. This court in reviewing the case, quoting from an opinion in the 87 N. Y. p. 40, said, "It is certainly not just that one who has perpetrated a fraud should be permitted to say to the party defrauded, when he demands relief, that he ought not to have believed or trusted him. When one sues another for negligence, his own negligence contributing to the injury will constitute a defense to the action; but where one sues another for a positive fraud or wilful wrong negligence by which the party injured exposed himself to the fraud or wrong will not bar relief. The question was whether the allegations of fraud made by the plaintiff were true and the court of appeals thought that this question was one for determination by a jury and that the trial judge had erred in dismissing the case without submitting the controversy to the latter tribunal.

Wilcox v. American Telephone & Telegraph Company, 68 N. E. 153. Reversed by New York Court of Appeals, October, 6, 1903.

NOTICE OF IMPROPER SERVICE NECESSARY IN GEORGIA.

In an action in the Georgia courts by the Atlanta Standard Telephone Company to recover a rental for use of telephone which was to be paid in quarterly installments by the subscriber, and in the contract of service there was a provision that rebate should be made for interrupted service after reasonable notice was given, the courts have held that the subscriber could not escape liability for the rental for his telephone for the time of any interrupted service of which he did not give notice in writing to the company. In the action the defendant attempted to give in evidence the fact that the service was of no value to him and to set this up as a reason for not paying the charge, but the court refused to allow this to be shown in the absence of written notice to the company of the defective condition of the telephone. Not having given the notice in the above way he was required to pay the rental.

Atlanta Standard Telephone Company v. Porter, 43 S. E. 441.

PHYSICIAN FAILED TO RECOVER.

The Cumberland Telephone & Telegraph Company by mistake disconnected the telephone of a physician, thinking that the rent had not been paid when in fact it had been paid. The telephone remained disconnected for something like eighteen hours during which time many persons called the central office and were informed that the telephone had been disconnected. The doctor brought suit against the company for damages. The physician failed to show that he had received any pecuniary loss and at the trial the court said that he could not recover "punitive damages," or those allowed as a punishment for torts committed with fraud or deliberate intent to injure another.

Cumberland Telephone & Telegraph Co. v. Hendon, 71 S. W. 435.

COMPANY PAID TWENTY-EIGHT DOLLARS A POLE.

The Pennsylvania Telephone Company was recently made defendant in a suit brought by one Emanuel Boyer by an appeal from the award of a board of viewers which had awarded damages to him for the placing of telephone poles on his farm, which amount Boyer thought was too small. The case consumed something like two days in trial and finally was settled between the respective parties by the telephone company agreeing to pay the plaintiff $28 each for the fourteen poles that it placed on his farm. By the settlement the telephone company was also obliged to pay one Josiah Boyer a few dollars in "damages." This gentleman based his claim for recognition in the distribution of the awards on the fact that he was a tenant on the farm in question. The disposition of this suit also ended several others brought against the company on the same character of claims.

Boyer v. Pennsylvania Telephone Company. Decided at Harrisburg, Pa., November 17, 1903.

STATE COURT CANNOT COMPEL UNITED STATES RECEIVER TO CHANGE TELEPHONE RATES.

A very important decision touching the right of a telephone subscriber to maintain legal action in a state court against a receiver appointed by a United States court in his official capacity was rendered at the November term of the Michigan supreme court in the case of Dr. T. N. Rogers against the Michigan Telephone Company. The controversy, which was then in the circuit court, was briefly noted at page 345 of the November (1903) TELEPHONY. The question on which Judge Steere of the Chippewa circuit court then denied the injunction to compel the company to furnish rates according to the provisions of the ordinance passed by the council of Sault Ste. Marie, was that a state circuit court had no authority to hear a case against a receiver appointed by a United States court when, if decided against the receiver, it would interfere with the administration of the trust given the receiver by the federal court. The circuit said in denying the application for the mandamus that the proper court in which to seek the relief prayed for was in a federal court, and directed the complainant thereto. The judge thought that the general law (section two of the act of Congress of March 3, 1887, amended August 13, 1888) which made provision for suits against receivers ap-

pointed by United States courts did not contemplate a suit to compel a receiver so appointed to vary rates of telephone service. This view was substantially upheld by the supreme court, which said that "to grant relator (Dr. Rogers) relief on his bill a state court must determine that he is entitled to telephone service at a lower rate than heretofore charged." Further, that a reading of the order appointing the receiver plainly leads to the conclusion "that the court which appointed the receiver claims the right to determine the rate upon which telephone service shall be furnished. The right to revoke this determination necessarily belongs to that court, and this right is necessarily exclusive. A state court has no more right to determine the rent which the receiver shall charge one person than it has to determine what it shall charge all persons. If such a determination were made it would, under the language of the statute, be subject to the general jurisdiction of the court where such receiver was appointed. It follows that if the state court should issue an injunction in this case its enforcement would depend upon the judgment of the federal court appointing the receiver." The question itself is a difficult one and there appears at first thought to be little difference between an effort to compel a receiver to change rates for service and an action against him to collect a judgment for personal injuries which is a common occurrence every day. The distinction is that a state court will not give any order which, if executed, would interfere with the express or implied authority of the receiver as delegated from the United States court. Where the order would in any way conflict with the "administration of the trust" it would be denied. The decision of the supreme court denying the petition for a mandamus temporarily puts at rest the telephone rate war at that city. The parties, however, have the privilege of appealing to the United States circuit court, sixth district, for a final adjustment of the differences.

Rogers v. Chippewa Circuit Judge. Mandamus in Supreme Court of Michigan, November 17, 1903, 10 D. L. N 689.

AN IMPORTANT KANSAS DECISION.

The supreme court of Kansas on the seventh of November last rendered a decision in the case of Michael McCann v. the Johnson County Telephone Company, which affects every telephone company in the state and casts upon them a responsibility which heretofore they have not been compelled to bear. McCann, a citizen of Gardner township, had some trouble with the telephone company in the placing of a telephone pole on his premises, and after cutting down the pole he brought suit by injunction to restrain the company from erecting poles on his premises at all, claiming that the fee of the land was in himself for all uses other than those conferred on the public for purposes of public travel and that the erecting of a line of telephone poles was an added burden and that before the company had the right to place the poles thereon it was obliged to get his consent and pay him for the damages which would be suffered by the presence of the poles on the premises. This view was not upheld by the lower court, which dissolved the injunction. The case was carried to the supreme court by the plaintiff and there the decision was reversed and the injunction made permanent against the telephone company, the court in part saying: "The fee of a rural public highway is in the adjoining land owner. The public has the easement only. The right of easement in the public does not authorize a telephone company permanently to appropriate any part of the highway to its own use by the construction of and maintenance of a telephone line, for such use of the highway casts an additional burden on the land for which the owner is justly entitled to compensation." The practical application of the principle above stated is that hereafter in every case before a telephone company may lawfully erect a line of poles along a rural public road in the state of Kansas it must first obtain permission from the adjacent land owner, and if consent cannot be obtained from him the company must resort to the method by condemnation proceedings. Press reports say that the decision applies equally to those companies whose lines are now erected as well as to new lines. It is doubtful if this view will receive much support, the more reasonable probability being that the courts will apply the rule to new companies to the exclusion of those whose lines have been long erected. It is certain, however, that the rule will apply to all new lines which will be erected in the future and will furnish a not altogether pleasant field for negotiations between the farmers and the telephone companies' agents.

Michael McCann v. the Johnson County Telephone Company, in Supreme Court, Kansas. Case decided November 7, 1903.

DAMAGES FOR CUTTING DOWN SHADE TREES.

November 10 last a verdict of $35 was awarded to Mrs. Eva Cartwright of Liberty, Mo., in the circuit court before Judge Alexander for the mutilating of shade trees in front of her premises by the Liberty Telephone Company. A portion of the decision is here quoted, which is a very clear statement of the law on this point: "A person owning a lot in the city of Liberty, abutting on a street, owns to the middle of the street in the aforesaid lot, subject to the right of passage over said streets by the public, and any trees growing along his pavement, between the middle of the street and his lot, are his private property, and cannot be cut by a telephone company in extending its wires without compensation being paid before the cutting is done. And if the owner and the telephone company cannot agree as to the damage, then the telephone company and the owner must have commissioners appointed to assess the damage and must pay the damage so assessed before it is permitted by law to cut the trees."

Mrs. Eva Cartwright v. Liberty Telephone Company, in Circuit Court, Liberty, Missouri. Decided November 10, 1903.

MAY A CUSTOMER INSTALL AN EXTENSION INSTRUMENT?

May a telephone company refuse to give service to a customer who has installed an extension instrument of his own purchase in his premises and connected same with the telephone circuit of the company? The answer to this question will depend upon two or three conditions, which, if we assume to be present, will give the company the authority to cut off service entirely. First, the customer must ask the telephone company to supply the extra instrument, and the company must be willing and able to furnish it; second, the company must be able to furnish an instrument up to the recognized standard of perfection; third, company must furnish "extension" at a reasonable price. Otherwise, if the customer can make a connection of this nature without detriment to the harmonious operation of the telephone system, there is no apparent reason why the customer might not furnish the "extension" of his own accord. An ordinarily modern equipped company would have little difficulty in compelling a customer to use the company's extension instrument under penalty of having his service discontinued entirely. A case decided by the supreme court of Rhode Island in 1901 (49 Atlan. Rep. 1004) is in point. The Providence Telephone Company had the exclusive franchise for the telephone business in Providence. Clarence T. Gardner was a practicing physician in the city and had the company's telephones in his residence and office. In order, as the doctor said, to make the service more convenient to him, he had purchased two extension instruments and had installed one in his house and the other in the office in rooms adjacent to those in which the company's instruments were placed. For these "extensions" he paid $50 each and had used them for many years without opposition from the company. Finally the telephone company, claiming that the use

of the instruments made the service defective, that the wires to the extras were liable to be poorly insulated and might cause fires for which the company could be held liable, although not in fault, and that the company was losing valuable rentals by this method of private purchase, ordered the doctor to remove them from his premises or the service would be discontinued. This he refused to do and brought suit by injunction to compel the company to refrain from carrying out its threats. The supreme court said that the injunction should be refused and that the company had the authority to carry out its plan to remove the instruments unless the doctor complied with the order.

The above question was raised November 27 by the law firm of Beach & Beach, Chicago, in an application to restrain the Chicago Telephone Company from refusing to furnish them with telephone connection because they had installed a private "extension" system in their offices in the Ashland block, for which they had paid the Stromberg-Carlson Telephone Manufacturing Company $165 to install. The law firm had endeavored to agree with the telephone company, according to the allegations of the complaint, but were unable to secure the service which they desired for a less expenditure than $600, whereupon they installed the instruments themselves and made connection with the wires of the company, which thereupon cut the lead wires and shut off all service. The law firm also allege that the telephone company's rates were "unfair, unreasonable and oppressive." The lawyers offer to pay the telephone company a fair rental for the apparatus necessary, or a reasonable sum for the lease of the company's instruments. Judge Tuley on the above date made an order restraining the company from refusing to give service until further adjudication of the controversy. It is said that the final decision of this question of the authority of a private individual to install and connect "extensions" with this company's telephone instruments will determine the collection of $1,000,000 of this character of rentals.

BARRED BY STATUTE OF LIMITATIONS.

The city of Bradford, Pennsylvania, filed a bill against the New York & Pennsylvania Telephone & Telegraph Company and the Pennsylvania & New York Telegraph & Telephone Company to compel them to remove their poles and wires from the streets. The city alleged that the companies were without authority in law to erect or maintain their poles or wires and averred that the defendant companies had erected and maintained a large number of poles in the city and had strung thereon a large number of wires and cables without warrant or permission from the city; and further that the companies were continually placing new obstructions in the plaintiff city by erecting new wires and poles therein. The bill also said that the city had ordered the companies to remove their properties from the city streets, but they had persistently refused so to do. The bill finally asked that the companies be restrained from erecting any more poles and wires and that those already erected be ordered by the court to be taken down. The companies in their answer contended that they had authority for the steps they had taken in perfecting their systems and that the city had recognized the rights of the companies by assessing and collecting certain licenses from time to time; that the companies had enjoyed these uses for a period of more than twenty-one years before being molested and that they were therefore protected by the statute of limitations; finally, that the companies were doing an interstate business and hence could invoke the protection of the interstate commerce laws. The case was tried in the court of common pleas of McKean county, where the companies had a verdict and the bill of complaint dismissed. The controversy was then carried to the supreme court by the city and again decided in the defendants' favor on a single point. The court said in part: "In the (lower) court's eight conclusions of law there is a summary of material facts, which were fairly found from the testimony They are that the borough of Bradford and the city of Bradford, its corporate successor, had permitted the defendants and their predecessors in ownership for more than twenty-one years to occupy the streets without protest or objection, the borough and city stood silently by during this period while the defendants were making an expenditure of from $75,000 to $100,000; that by numerous resolutions passed by both branches of the council, and many of them approved by the mayor, consent had been given to the erection of the poles, cross-arms, etc., on the streets and highways of the city; that for the privileges extended by it to the defendants it had received a valuable consideration in the use of the poles for the carrying of the wires of its fire-alarm service; that it had received and duly receipted for licenses and pole taxes assessed against the defendants; that it had used the telephone instruments furnished by the defendants down to the hearing of the court below; that a consideration to the city in extending privileges to the defendants was a reservation of the 'topmost gain' for police and fire protection." Finally, that the city in allowing all of these uses and accepting the various accommodations of the companies had so long acquiesced in the presence of the fixtures that it amounted to a use of so long standing and notoriety that the city could not at the late day even raise a question as to the validity of the rights under which the companies were doing business within the limits. The statute of limitations was a bar to any other rights of action that the city might set up to oust the companies. The decree was affirmed and the costs charged against the city.

City of Bradford v. New York and Pennsylvania Telephone & Telegraph Company et al., 56 Atlan. Rep. 41. Decided July 9, 1903.

USE OF RAILWAYS IN TEXAS.

What is the proper method for a telephone company to pursue, organized under the laws of New Jersey, to secure rights on railways in Texas?

Having attained the right to enter such lands, what will be the measure of damages for such occupancy?

The Texas courts have said in the case of the Texas Midland Railway Company v. the Southwestern Telegraph & Telephone Company (57 S. W. R. 312) that a foreign corporation must, in order to secure the right suggested in the first question, obtain permission to do business within the state in a proper legal way. Having the right to do business within the state, the company may then make claim to the right of eminent domain in the same way that local companies can, the first consideration being that the foreign company first secure the right to do business within the state, after which its right to condemn property is no different from that of companies organized under the laws of Texas. In the above case the telephone company sought to condemn a right of way for its telephone line over the right of way of the railroad company. The railroad, being dissatisfied with the word of the commissioners, who were appointed to assess damages, brought the case before a jury in the Lemar county court and secured a judgment against the telephone company. The case was carried to the court of civil appeals, where the question of the right of the telephone company to condemn lands was discussed. This court said as follows: "A foreign corporation which has secured from the state of Texas a permit to do business therein may exercise the power of eminent domain in all cases in Texas where corporations created under the laws may exercise this power." The company having the right to do business within the state, had in this case the power to condemn the right of way over the railway property.

The amount of damages which the railway company would be allowed to recover in case of condemnation proceedings of this character would be determined by finding out how much the railway property for railway purposes

decreased in value as a result of the telephone lines and poles being placed thereon. The above case furnishes a guide to the Texas rule on this subject. The Texas Midland Railroad Company sought to obtain from the telephone company as the amount of damages to which it was entitled the *value* of the land appropriated by the telephone company. In other words, the railway company sought to compel the telephone company to practically buy the land which it was to use for its poles and wires. The court of appeals said that this was not the true rule and that the railway company was only entitled to damages for the decreased value to the railway company of the use of its right of way for its purposes that might result from the construction and maintenance of the telephone line. The court further said that the railroad company was not entitled to recover the value of the land taken by the telephone company for its right of way. The railway, in fact, only suffers damage to the extent that its advantages and uses are diminished. A railway in the first instance has only a *right of way*. This is a grant from the state of certain rights and privileges to the company. Its title to the lands which it uses is no greater than the rights and privileges which the state has bestowed upon it, and if they are taken away it can suffer no greater damage than the loss of these advantages and privileges. It in no case would be entitled to the value of the land. The right of eminent domain being given by the law, the telephone company having taken proper legal steps to enter upon the right of way of a railway, would, in view of the above facts, only be obliged to pay the railway company an amount in money which would compensate it for the rights and privileges taken away.

HORSES FRIGHTENED BY TELEPHONE POLES.

November 4, 1900, a team of horses attached to a vehicle was being driven by H. C. Vandevort along a public highway in Kansas. At a certain point in the intersection of the highway along which he was driving and a crossroad there had been placed by the Missouri & Kansas Telephone Company two telephone poles. The poles had been thrown on the side of the highway near a hedge fence, and as Vandevort approached them by turning suddenly from one road to the other, the horses became frightened and ran away. Vandevort was injured and one of the horse's legs was broken so that it was necessary that the animal be killed. Suit was brought in the district court of Sumner county for damages for the injuries which had been sustained. Vandevort in his claim alleged that the telephone company had been negligent in leaving the poles in the position and place at which they were left, and that thereby an obstruction had been made, the natural result of which was to frighten horses. At the trial he recovered a judgment against the company, whereupon the case was carried to the supreme court of the state.

At the trial the *opinions* of witnesses had been offered to show that the poles were calculated to frighten horses. The telephone company thought that the situation was not one in which opinion evidence was admissible. The second objection made by the company was that, even if Vandevort had the right to show by opinion evidence that the poles were calculated to frighten horses, he ought to have limited his evidence of this character to horses which were ordinarily gentle. The supreme court, in discussing the question of opinion evidence in the case, said that where opinion evidence is the best evidence that can be produced it is admissible, but where the facts to be deduced can be placed before the jurors' minds in the ordinary way, and as in this case the ultimate fact was whether or not the poles were liable to frighten horses, the opinions of persons in the matter was not fit evidence to present to the jury. The jury should have been apprised of the position of the poles and all collateral facts, and then left to decide the question whether the poles were liable to frighten horses. The witnesses for the plaintiff were also allowed to say that the poles as they were placed were calculated to frighten horses generally. This also, in the opinion of the supreme court, was a prejudicial error in favor of Vandevort. "If the company was liable at all," said the supreme court, "it would only be so if the poles were such as to frighten reasonably gentle and road-worthy horses. The questions asked and opinions given were not so confined, but included a class and character of horses for the frightening of which the company could in no event be held responsible." On these two errors the supreme court reversed the judgment and remanded the case for a new trial.

The Missouri & Kansas Telephone Co. v. Vandevort, 14 Am. Neg. Rep. 291.

A JUDGMENT FOR SIX THOUSAND DOLLARS.

November 11 last, in the circuit court of Johnson county, Missouri, a judgment for the above amount was awarded Stanley M. Hyer against the Missouri & Kansas Telephone Company. Hyer recovered from the company on the allegation of injuries received in May last by receiving a shock from a telephone wire leading to his telephone having become charged from an electric light wire with which it had come in contact. The plaintiff fell from a second-story window when he received the shock and fractured a knee and also was burned by the wire.

AN IMPORTANT SUIT SETTLED.

The suit between the Telephone Subscribers' Association of the District of Columbia and the Chesapeake & Potomac Telephone Company, which has been in the federal courts for several years, has finally reached a settlement and the matter of rates is practically left unadjudicated by the courts, although the suit has been several times before various courts of the District. The act of Congress of June 30, 1898, which brought on this suit, will remain little more than a nullity, as it has been since its enactment.

INDEPENDENT TELEPHONE SYSTEM.

There seems to be no let up in the demand for Independent telephone service. This fact can be accounted for by the fact that when the Bell Company occupied the ground of unrivalled monoply and the result of this monopoly convinced the progressive mind of advantages to be gained by competition, the Independent people recognized that to be successful they must do their best, must reduce cost, give better service, must meet their patrons with business propositions. These things they have done.

Another reason for the success of the Independent movement is, telephone service is valuable in proportion to the number of subscribers connected with the system. This statement of fact brings forward some statistics: In Ohio the Independent people have about 150,000 telephones, the Bell less than 90,000; in Indiana the Independent outnumbers the Bell by two and one-half times; in Kentucky two times, while in the United States the Independent have over 1,500,000 more telephones than the Bell, and the people in general and business men in particular are quick to understand and seize upon that which gives maximum service at minimum cost—or, in other words, they are eager for the project that will reap the greatest harvest and reach the most people—hence the deserved popularity of the Independent.—*Washington C. H. (Ohio) Herald.*

The Nebraska Independent Telephone Association will hold its annual convention at the Lindell Hotel, Lincoln, Nebraska, on January 18. This promises to be the most important and largest meeting in the history of the association.

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The Economic Management of Modern Telephone Exchanges

CARL C. CURTIS, A. M. A. I. E. E.

CONSTRUCTION DEPARTMENT.

It is not the purpose of this article to go into the matter of details of construction to any great extent. Other writers have covered this subject so completely that but little original matter can be added to the literature of the period which deals with a topic so broad. Of late, construction of telephone exchanges has been carried on more extensively by contracting concerns that make a business of it with the result that the business management of this portion of a plant is far better understood than that of any other department. Notwithstanding the higher development along this line, construction work in the vast number of exchanges has been most imperfect, owing to ignorance, short-sightedness and false economy.

CONSTRUCTION DEPARTMENT.

THE.....TELEPHONE CO.

Daily Work Report at ..... Exchange

Construction of

Weather 190

POLES	20	25	30	35	40	45	50	55	60	Cost	Labor
Unloaded Car											
Hauled											
Shaved											
Framed											
Set											
Stepped											
Taken Out or Moved											

CROSS ARMS	No.	Cost Labor	WIRE	COPPER Size	COPPER No. Ft.	COPPER Cost	IRON Size	IRON No. Ft.	IRON Cost
Pinned and Braced			Strung						
Hauled			Pulled and Tied						
Put On			Taken Down						
Taken Down									

CABLE WORK	STRUNG No. Ft.	STRUNG Cost	SPLICED No.	SPLICED Cost	POT HEADS No.	POT HEADS Cost	BOXES No.	BOXES Cost	BRIDLED Ft. Wire	BRIDLED Cost
200 Pr										
100 "										
75 "										
50 "										
25 "										

MISCL.	No.	Cost
Holes Dug		
Stubs Set		
Anchors Set		
Mess Hangers		
Insulating		
Transposing		

Guys Put on .....No..... .....Cost.....

Kind of Soil.....

Messenger Strung.....Size.....Cost.....

.....Foreman.

FIG. 28.

After an exchange is once well started, and has commenced active operation, the construction force can be materially reduced; but even with a reduction, a thorough, systematic method for handling the details of the department is necessary. The history of nine tenths of the telephone companies of the United States proves beyond the shadow of a doubt that most of the poor construction and faulty installation has been done after the main body of the exchange was completed. Managers will do well therefore to look closely into this end of the business, when the process of cutting is concluded.

CITY FOREMAN.

The head of the construction department in small exchanges is usually called the city foreman. Like the cashier, wire chief and chief operator, he should be given practically absolute authority to conduct the force of his department in an efficient and responsible manner. Whenever absolute authority or responsibility is conferred upon an employe, it is taken for granted that he is capable of maintaining it; a person who is not, can fill a position of responsibility in no exchange satisfactorily.

In addition to a thorough knowledge of line construction it is well that the city foreman should understand cable work, and many exchanges have found it profitable to employ for this position, a competent cable man who is also a line man, but it is most difficult to obtain the combination along with other desirable traits. It is unnecessaray to say that executive ability is an essential requirement and that sobriety is likewise an important qualification with which he should be endowed.

DUTIES.

The duties of a city foreman are generally well understood. He is supposed to report to and receive his instructions from the manager direct. He should have charge of and be responsible for the condition of the wire plant, and the quality of all new construction work carried on under his supervision. It should further be his duty to make any changes or repairs of lines, when notified of the necessity by the wire chief, or whenever the same may otherwise come to his notice. In cases of storms or unusual trouble, he is expected, together with his force to go to the assistance of the maintenance department; in which event he takes

charge of general repairs and reconstruction of lines and the removal of crosses, working his men in harmony with the regular maintenance crew.

Cable boxes and cables come directly under the city foreman's jurisdiction and he should be held strictly responsible for the efficiency and general condition of repairs. Whenever his crew is insufficient to handle work that is before

CONSTRUCTION DEPARTMENT
THE.....TELEPHONE CO.

Daily Work Report .....190....
Exchange .....

Climbers	Wire, Iron, 14
Groundmen	Wire, Iron, 12
Poles.....feet	Wire, Iron, 6
Poles.....feet	Wire, Copper, 14
Poles.....feet	Wire, Copper, Wrpf
Poles.....feet	Wire, Iron, Wrpf
Pole Steps	Wire, Pair
Cross Arms	Wire
Braces	McIntire Si
Pins	Strand, 7-16
Glass	Strand, 5-16
Transposition	Tape, Oko
Knobs	Tape, Frie
Screws	Guy Clamps
Screws	Shims
Brackets No. 1	Protectors
Brackets No. 2	Anchors
Brackets No. 9	S ubs
Brackets, Wood	Staples
Bolts, ⅝x3½	Marlin
Bolts, ½x	C ntacts Down
Bolts, ½x	Horse and Wagon
Bolts, ½x	Other Teams
Bolts, ½x	
Bolts, ½x7 Lag	
Bolts, ½x3½ Lag	

Remarks.....
.....
.....Foreman

FIG. 29.

it, and where employment of additional men is unwarranted or unadvisable, it should be his privilege to call upon the maintenance department for assistance.

In previous articles, we have recommended that companies encourage their heads of departments to visit other departments in order that they may keep themselves informed of the progress of the art, and to enable them to study the workings and practices of other companies. This

THE.....TELEPHONE CO.

TIME CARD.

	Construction						
.....Town	Switch Board.	Wire Plant.	Sub-Station.	Maintenance.			
.....Town							
.....Town							
Horse and Wagon.							

DATE SIGNED,

FIG. 30.

advice applies with equal force to the position of city foreman.

LINE MEN.

The training of line men, both telephone, telegraph and electric light, has always been most imperfect and to this fact we can lay much of the expensive, unsightly and dangerous wiring and construction which we see in our cities. It is often the case that when a raw recruit starts to work with one company as a ground man, and works for six months, and then applies for a position with another company, where he may not be known, he will claim and obtain the pay of an expert line man providing, of course, he has learned to climb. Men who have first learned electric light or telegraph work, do not as a general rule become good telephone line men, and most construction men prefer to train their own men from raw material. The work of the "floater" (the individual, who drifts from town to town, rarely staying a day in any place) is most unsatisfactory. He is not interested in his work and consequently no dependence can be placed upon him.

The best lineman is the man who has been taken as a ground man and has worked up gradually, learning to do the work thoroughly under the watchful eye of his foreman, until he acquires proficiency that will justify his being trusted alone. In the early stages of his career every portion of his work should be carefully and critically scrutinized and all mistakes corrected. Promotion and increased pay should follow improvement and meritorious work.

SPECIFICATIONS.

Good results in construction work can be secured only by pursuing a well defined course, mapped out by a set of specifications, drawn up by a competent, practical, telephone engineer. In this connection it might be noted that there is a wide difference between a civil and electric light engineer, and an expert telephone engineer. Either one in the other's place is like the proverbial bovine in a china shop. For this kind of information some of our largest Independent organizations have paid dearly. The author does not intend to inflict upon the reader a set of construction specifications. The electrical journals of late have published some most excellent matter along this line, which companies can do worse than to follow, but it is well to warn the uninitiated against wasting money on some of the trash that has been widely advertised and sold as "Specifications," for from fifty cents to a dollar a set. The writer recently examined one of these "complete sets" for which the victim had paid $2.50 and was astonished at the utter, hopeless, ignorance displayed by their author. They represented what passed for fair construction twenty years ago, but the most rigid scrutiny failed to reveal a single modern idea, or practice that could be regarded as worthy of emulation.

RECORDS AND REPORTS.

Unless the exchange is in process of construction or elaborate reconstruction, care of the few reports and records is a comparatively simple matter; a system which reduces to a minimum clerical work on the part of the city foreman is greatly to be desired, but it should be sufficient to enable one to ascertain accurately and quickly the cost of all new work in detail. If the city foreman makes out a work report and a time card, this will be ample, since from these two, the office force can readily obtain a summary that will show the scope and extent of the construction work carried on during the month.

DAILY WORK REPORT.

A daily work report designed for use during periods when considerable construction work is being prosecuted, is shown in Fig. 28. It should be made out each day by the subforeman in charge of each job and the totals from all reports are entered on a monthly labor record for future reference. This monthly labor record is a classification in tabular form of the different varieties of operations which compose construction, such as setting poles, stringing wires, etc., and shows how much, and what was done, and the cost of each item. This is invaluable for estimating.

For the general run of construction and repair work in the average exchange, the form shown in Fig. 29 will serve

to good advantage, and the totals therefrom can be carried to the monthly report as before.

TIME CARD.

Fig. 30 represents a time system used in connection with the voucher system explained under the caption "Accounting." Its object is to divide and classify all labor according to the account to which it is charged. This time card is also used by the wire chief in reporting the time for his men, enabling the cashier to divide the pay roll disbursements between construction and maintenance.

THE CONSTRUCTION WAGON.

That a wagon is a necessary part of the equipment of a telephone exchange ambitious to handle its work economically, has become generally accepted. The average wagon, however, is utterly unsuited to this work and one of special construction is desirable. We give herein specifications for a wagon which will fill almost every requirement at a low cost, running in different localities from $125 to $150.

The type of this wagon shall be known as a full hound wagon with Concord gear. The bottom of the box is to be level, 10 feet long, 10 inches deep, and of regular width. It shall be clear over both front and rear wheels. The gate is to be secured with a strong chain of proper size. The height of wagon bed from floor of box to ground, 40 inches. There shall be three springs of sufficient size to hold 4,000 pounds with ease. The following dimensions have been found satisfactory: Rear springs 2x36 inches. Number of leaves in same, six, provided for ½ spring when necessary. Front springs 2x36 inches. Number of leaves, seven. The wheels shall be provided with steel tires, wider than the felloes and of sufficient dimensions to carry the load. The wheels should be of the following size: Front wheels, diameter, 36 inches; spokes 1⅛ inches, rear wheels 48 inches, spokes 1½ inches. Diameter of axles 1½ inches. The seat shall be enclosed to form a tool box to which the seat proper shall be hinged with heavy strap hinges secured behind with hasp and padlock; the raising of the seat will expose the tool chest. A step, or running board of the approximate

CONSTRUCTION WAGON.

dimensions of 5x24 inches will run along the wagon box at a sufficient height from the ground on either side, to enable a person to have access to the wagon without difficulty. The wagon to be painted and finished in the best manner, and to have the words ..... Telephone Company on the side of the box. The color of the body to be selected by the purchaser. A pole, shaft, neck yoke, and whiffletrees shall be provided. The entire wagon to be delivered to the purchaser ready for use complete.

DIGEST OF TELEPHONE AND KINDRED PATENTS

Information concerning any patent will be furnished without charge by addressing Edward E. Clement, Editor of this Department, McGill Building, Washington, D. C.

744,103—Telephone cut-out. W. L. Ralston.

A carbon lightning arrester combined with a switch. Metallic circuits are evidently unknown in Westchester, Iowa, where Mr. Ralston lives. The switch-arm can be used to cut in and out the telephone, or to connect it to either one of two "extra lines."

744,106—Lightning arrester. H. E. Raymond.

An arrangement for facilitating discharges from a line, but preventing line current from following the arc.

744,177—Private telephone system. T. J. Seeley and C. Hemsing.

An intercommunicating system of purely conventional type, having common battery for signalling and local batteries for talking. The usual features are present of an individual wire for each station connected to the switch-hook of its own station and to the corresponding contact of all the other stations; a common return for the calling battery; line-terminals in the shape of springs overlying a common battery terminal at each station, and a detent for any spring, controlled by the switch-hook.

744,197—Thermal circuit protector. O. C. Hoffman.

A circuit breaker and sneak current arrester of the "self-soldering" type. That is, after the device has opened the circuit it repairs itself and is ready for another operation, and so on indefinitely. A graphite pencil is used by preference, instead of a heat coil. In use the device is slipped in between the line-springs in the usual manner.

744,337—Means for disinfecting telephone transmitter mouth-pieces. M. Griffen, S. Sanker and B. Keith.

A holder for a wick saturated with disinfectant, combined with a slide for turning on and off the odors. The inventors ingenuously remark that "the odor from the disinfecting material is pleasant and agreeable to most persons, if not all." If this is true they ought to give the recipe to an expectant and suffering world. Ever since the microbe theory was invented, enterprising chemists have been trying their best to see how much in the way of a smell the human race will put up with. Davy Crockett's coon may have said, "Don't shoot, Davy, I'll come down," but I feel sure that the fiercest microbe would fall fainting from his perch, without a word, merely at the thought of the delectable treat embodied in some of the new disinfecting apparatus.

744,497—Telephone hygienic appliance. H. L. Cutter.

A device for feeding a roll of paper across a transmitter mouth-piece, always keeping a clean spot available. It comprises a sheet metal frame having arms at one end in which the paper roll is journaled, and arms at the other end in which a split spindle, having a milled head, is journaled, for the purpose of drawing the paper across the frame merely

by turning a thumb-screw. The trouble with devices of this character is that like public roller towels they are apt to be neglected, and in that case it soon happens that the clean spots are dirtier than the dirty ones.

744,631—Insulator. E. F. Schoenthaler.

An insulator having two openings on opposite sides for the reception of line wires, and two little openings in the jaws on each side for the reception of a "closing wire." The idea is that a line wire is laid in the large opening, then the "closing wire" is put on, and then a tie-wire is adjusted "to prevent lengthwise movement." The simplicity of this device reminds me of the old tar who at certain times could clearly make out sixty-four points to the compass instead of thirty-two, and of course could steer to a much greater nicety when he was in that state!

744,655—Combined signalling and telephonic intercommunicating system for railroads. J. A. Whyte and G. C. Edwards.

A scheme for enabling train operators and train crews to communicate while the trains are moving. The broad features are all old, as the problem has been recognized and attempts have been made to solve it ever since railroads have been in use. The tower or other operator or train dispatcher has a telephone, a Western Union switchboard and a set of annunciators. The engineer has in his cab a telephone and a magnetic semaphore arm which not only shows a red signal, but works a valve to blow the whistle when the train is called. On the cab is a contact which at intervals along the road comes against another contact strip fixed to the poles and connected to the line wires. These lines lead into the dispatcher's or operator's office, and through the respective annunciators and the switchboard to the latter when plugged in. At such time, when a train comes near and touches a contact the magnet in the cab takes current, lifts its arm to show a red disc and opens the whistle valve. The engineer then stops and calls back with his magneto, when conversation can be had. These inventors are Canadians and evidently telegraph men. probably operators.

41,497—Trade-mark. General Electric Company.

This trade-mark consists of a red thread and a black thread incorporated in the covering of an electrical conductor. How many telephone people have made or used wires with a red and a black thread?

744,735—Telephone exchange. C. S. Exley.

A single-cord switchboard for very small exchanges of the type commercially known as "farmers' switchboards."

744,936—Receiver for wireless telegraphs or telephones. Andrew Plecher.

The novelty in this patent consists in the use of a capillary electrometer instead of the ordinary coherer. A vertical wire is suspended in the air by means of a balloon and has its lower end connected to a switch, which can be connected with the electrometers. The electrometers consist of a glass tube or tubes whose internal channel or bore is a little less than a millimeter in diameter and holds in suspension by capillary action a fine column of mercury, which does not extend to the lower end of the tube. The lower end is open and is immersed in a solution of potassium cyanid, to which is preferably added about one per cent of silver cyanid and ten per cent of potassium hydrate. This liquid extends up to meet the mercury in the tube. The solution is held in a glass bowl having at the bottom a little mercury, from which connection is made to ground through wires.

Electrical impulses in the wires due to electro-magnetic waves pass to earth and cause the mercury to rise in the tube, closing the circuit and ringing a bell. To answer the call the attendant throws the switch over to the contact and further transmitted waves will then cause a rise and fall of the mercury in the legs of the electrometers. By having an air chamber over a body of mercury connected with the legs the rise and fall of the mercury may be detected by sounds due to air compression. For this purpose ear tubes are provided. Another method is to provide a floating microphone, which is jarred by the rise and fall of the mercury and produces changes in the local circuit that become audible in the receiver.

744,946—Automatic telephone exchange. W. B. Vansize.

An elaborate and rather fanciful scheme for an automatic exchange. It does not appear that the system could be adapted for modern common battery work. Local batteries at the subscribers' stations are employed for signaling. It is unnecessary to point out all the weak points of the system, considered from a practical standpoint. It embodies some bright original ideas, but it is far from commercial. The number of lines that could be served under the most favorable circumstances is very limited; the subscribers must all wait when calling until the machine is free; the selector would be difficult if not impossible to construct so that it would work in exact synchronism with the transmitters at the subscribers' stations; and the hot plate scheme would be a source of much irritation, to say the least, when its eccentricities came to be known. Half the time subscribers would get double their money's worth in time and the other half they would probably be cut off prematurely. No means seems to be provided for informing a waiting caller when the machine is idle, so he must simply keep on grinding his transmitter till something happens. If a subscriber calls once and the man wanted does not answer there is no way to repeat the call without clearing out and calling again. Finally, the amount and complexity of apparatus required for a few lines would put it in the same class with Mark Twain's battery of artillery used to kill a bug. This invention contains the hints of better things, and so may be useful, but except for this and for some of the claims, which are well and skillfully drawn to cover real inventions by others, there is nothing in it. It is becoming most apparent that our patent laws should make provision for barring applicants with mere paper inventions from obtaining claims that act as stumbling blocks to later inventors who really do something of use.

745,019—Telephony. Isidor Kitsee.

Another paper invention. Dr. Kitsee has been doing something in the inventing line for many years. At least one of his patents has long been owned by the Bell Telephone Company, and is supposed to have some bearing on the common battery situation. The present case is apparently not in the same category, however, although it is supposed to set forth a workable common battery system.

A divided switchboard without cords is described. One board is termed the "call board" and the other the "distributing board." Calls are received on the first and connections made on the second. Dummy plugs are employed, connections being established through sliding plates and individual plunger switches.

745,049—Telephone transmitter support. A. Gamache.

A double transmitter arm with parallel motion. Two members are pivotally secured to the lugs on the transmitter and have cross arms or trunions that lie in recesses in the face of the coil box. The ends of the trunions are held down by side strips secured in place by screws and nuts. The screws have milled heads whereby they can be tightened up to increase the friction on the trunions and thereby regulate the freedom of movement of the transmitter. The

arms are hollow and receive the wires through the openings.

745,235—Telephone alarm system. John D. Peachey.

An improvement over an invention patented to Mr. Peachey a short time ago, which was duly noticed in the digest. The scheme is to have a fire or burglar alarm circuit and apparatus therein which when energized pulls the receiver of an adjacent telephone set off its hook and thereby calls central, enabling her to hear the alarm bell ringing. According to a modification of the invention, a buzzer can be fastened to the transmitter, so as to alarm central without informing the burglar thereof.

745,292—Alternating current telephone. Andrew Plecher.

The invention claimed in this case is confined to the transmitter. All secondary telephonic currents commercially used are alternating currents, but for many years it has been the dream of some inventors to produce alternations in the primary circuit. In some cases this has been accomplished with a single battery by an arrangement similar to that of a pole-changing switch. In other cases front and back electrodes have been employed, with separate batteries and an intermediate electrode working between them, strengthening the contact on one side while weakening on the other. This is the method adopted in the present case, although Mr. Plecher does not confine himself to the primary circuit, but also puts a pair of electrodes in each side of the secondary circuit.

745,341—Switching apparatus for telephonic or other switchboards. F. W. Francis.

A self-ejecting switchboard plug, or rather a telescopic plug controlled by the operator without following up the cord, which is sometimes difficult when many cords are up. The inventor is an Englishman, and the invention will never be used in this country, nor in any place where small centers are common.

745,342—Answering and recording telephone. T. D. and C. J. Freese.

This invention contemplates the employment of phonographs at a telephone station which in the absence of the subscriber will answer calls and receive messages.

745,388. Telephone system. G. Ritter.

This is a rather peculiar case. Mr. Ritter is an engineer of Stuttgart, Germany, and he already has a number of patents which show that the Germans are gradually taking up modern ideas, although they are still a mile or two behind the Americans. It takes seven pages of print to describe the many forms of the invention which Mr. Ritter submits. Two claims were all he was allowed, however, relating solely to combinations whereby a call may be registered if it is answered. A test circuit is provided which is closed as soon as the operator sets up the connection.

745,523. Telephone system. G. Ritter.

This patent covers a hybrid system. It is neither magneto nor common battery, and appears to have the virtues of neither and the faults of both.

745,579. Telephone exchange system. W. W. Dean.

A common battery system without any cut-off relays. The line relays, once energized, remain so until the conclusion of the connection, but the lamp circuits are opened when a plug is inserted.

745,694. Fuse block. M. R. Utley and B. J. Clements.

A fuse holder of the enclosed chamber type now so generally used for protection against high potentials, with a visible indication of the condition of the enclosed fuse. A hollow dome of porcelain has an inner base of the same material provided with a handle and suitable fastening devices. The dome and base may be flat if desired. On each side of the dome bottom is a binding post, and to these the line wires are secured. The base or plug carries a fuse stretched between the terminal plate and a screw terminal on the end of a spring held thereby under tension. Under the spring a slide lies in a flat slot in the base, held up by a pivoted lever, which is maintained in the position by a spring. When the fuse blows the spring flies up, opening the circuit with a wide gap and also releasing the lever, which immediately pushes down the slide to indicate the fact.

745,734. Multiplex telephony. W. M. Minor.

It has often been proposed in telephony and telegraphy to utilize a single circuit for a number of messages by establishing at the opposite ends synchronously operating switches termed "distributors" or "sun-flowers." These would operate together to connect the line successively to separate local branches, each branch having possession of the line for brief recurring intervals, the breaks and makes being so rapid as to permit intelligible transmission without substantial interruption. Mr. Minor's invention consists in synchronously closing the connection between the line and corresponding branches or sub-circuits with a frequency corresponding to the frequency of the tones and over-tones characterizing speech. In other words, rotary switches are driven so as to produce something like 4,300 makes and breaks per second. The specific means to do this is not described, and the claims are to the method only.

745,978. Telephone tablet attachment. G. M. Urie and A. A. Markam.

The present patent is granted on an application forming a division of the former application of the same inventor's No. 119,759. In the former case a desk set is described, having a pressed metal tablet adjustably secured on it. In the present case a bolt extends across the desk of a wall set, being screwed into clamps. The tablet carries the paper roll from which the paper is fed up and down through slots and under the tension member. The tablet is supported on a bracket secured beneath it and having two holes whereby it may be secured with a suitable nut on the end of the bolt. The side face of the bracket has radial ribs or grooves around each of its two holes, co-acting with a rib on the clamp collar to hold the tablet in any position to which it is adjustable.

745,999. Insulator. S. Bower.

Another insulator supposed to require no tie-wire. Its principal use is doubtless intended to be in inside or local wiring.

746,021. Telephone directory. F. H. Chamberlain.

Mr. Chamberlain aims to provide in connection with a standard of a desk telephone instrument an endless movable surface bearing the names of numbers of the persons most wanted. Names are written or printed on the surface of a cylinder, which is an endless surface. This reminds one a little of the prayer cylinders in India. A prayer written on a piece of paper and dropped into the copper cylinder at the door of the temple is supposed to be repeated as often as the cylinder is revolved. By putting a windmill on the device the bombardment of the gods is rendered exceedingly numerous and effective. I would suggest that Mr. Chamberlain might print a few stirring remarks on his cylinder for use in emergencies, and then if a subscriber could not twirl the cylinder fast enough to express his feelings, he might gear up a fan-motor which would satisfy him without hurting central.

746,040. Telephone system. W. W. Dean.

A common battery system having the cut-off relay in series with the line-relay, in the line, between the jacks and the battery. The cut-off relay is polarized so that it does not respond to the primary calling current. The cord-circuit battery is reversely connected, however, and when brought into connection with the line it reverses the current through the cut-off relay and operates the latter.

746,065. Selective telephone system. A Gagnon.

A rather ingenious selective party-line system. At each station a pair of relays are employed, and these relays are so adjusted that a predetermined current flow through each is required to move its armature. At the central station or any other station a resistance box is provided with means to plug or switch in or out successive resistances corresponding to the stations to be called. The magnets at all the stations are permanently to line, each pair being in series in a bridge of the line. The ringer at each station is connected in a branch around the magnets, normally closed at the contacts of one relay and normally open at the contacts of the other. In order to call station No. 1, the generator is actuated to send current just sufficiently strong to energize the magnet at station 1, to close its break in the bell circuit, without energizing the magnet. The bell therefore rings. To ring up the second station a little stronger current is put on the line. This energizes both magnets at the first station, the first magnet at the second station, and none beyond. Bell at station 2 then rings. The second magnet at each station and the first magnet at the next respond to the same current. With each successive increase in current strength therefore all preceding stations are opened, all succeeding stations are left open, and only the station selected is rung up.

746,095. Switching apparatus. W. Kaisling.

A party-line ringing key. Selective party-line ringing nowadays is accomplished by means of selective keys which put the generator and ground in proper relation to the desired side of line, and a master-key completes the connection to line. In the present case two posts on a plate support between them a web carrying the springs. The master-key is actuated in every case to ring. But one of the others is depressed at once, and it is sometimes necessary to remember which one in order to ring again. For this purpose a slide is fitted on a dove-tail strip, and the heads of the selective key stems are cut off flush with the top of this strip. A slide carries a single push-button head which can be made to register with any one of the key stems. Opposite each key stem is a colored spot by which it may be distinguished.

The position of the slide determines the last key used, and accurate registry is attained by a spring pin on the slide taking into notches on the base.

746,210. Telephone bracket. H. S. Waite.

This is a lazy-tongs bracket for carrying a desk set. The feature of invention is the employment of a disc riveted on the middle joint of the tongs, with stop-pins extending up between the arms. This is said to keep the device from lateral bending or twisting and from being pulled out too far.

746,314. Telephone switching apparatus. N. A. Engstrom.

This patent has quite a broad claim, and presents one form of the Stromberg-Carlson switch-hook. The Stromberg-Carlson Company owns both this and the Kaisling patent already noticed.

746,362. Insulator hanger or bracket. G. H. McFeaters.

This invention presents a means for attaching insulators to structural iron work. It comprises a metal clamp adapted to be fastened on to the flanges of iron beams or girders, and has flat faces to which the insulators may be screwed. The faces permit two or even more insulators to be attached to each clamp.

746,624. Switchboard. J. B. Wood.

A very simple form of switchboard for very small exchanges.

746,690. System of telegraphing or telephoning to or from railway vehicles. J. Edgar.

Mr. Edgar hails from Wrexham, England, and his invention is to enable the "driver" or "guard" of a train to communicate with the "signalman" or "stationmaster." In order to appreciate the extreme beauty of the invention, and the very important character of the patent in this country, one should know that the genuine Englishman is a person of great mental inertia. It takes a lot of energy to get him started along a given line, but it takes a lot more to stop him. When steam railroads first came into being the English engineers conceived what they thought was an excellent scheme for rails. They rolled their rails just the same at top and bottom, that is the tread and flange were mates, and in section looked like a dumb-bell. Each rail was supported in "chairs" on the ties or sleepers, and the idea was that after a rail got worn on top it could be turned upside down and be used all over again. Unfortunately, a fact developed that would have been the first thing to occur to a wide-awake American engineer when designing the "blooming thing," viz., that as soon as the top was worn the bottom was cut and dented by the chairs. So they might just as well have come back to the flat bottom rail spiked to the ties. But this is not English character. So they didn't. They continued to use the chairs, they are still using them, and Mr. Edgar has designed his system to have its conduits supported in the chairs. The most that need be said on this point is that we do not use chairs in this country.

746,979. Party-line bell. L. Moore.

A polarized ringer having a fixed naked magnet, and the winding on the armature. Pole-pieces are formed by tapping large iron screws through the ends of iron straps on the poles of the permanent magnet. This permits adjustment by screwing in and out, and a normal bias is given to the armature with its winding by a spring whose tension is adjustable.

RURAL TELEPHONE LISTS.

In an interesting article on the subject of "Mail Advertising" Mr. J. N. P. Cramer is quoted in *Printer's Ink* as bearing testimony to the value of such purposes for the lists of telephone subscribers in rural districts: "Some of the little Independent lines built by farmers for their own communities are only fifteen miles long. They have perhaps 100 subscribers. The subscribers' list of such a line gives names that have been hard to get heretofore, as they are in no directory. The rural telephone sorts out the influential classes in every community and lists of names made up from telephones are excellent for high-class propositions. I should call such names the very best that could be secured for investment advertising. So far as I know we are first to compile such a list. We began a few months ago. The telephone directories have been difficult to get and have cost us a pretty penny. We now have 50,000 names in New England, 150,000 in New York, 20,000 in New Jersey, 80,000 in Pennsylvania, 100,000 in Ohio and 200,000 in other Eastern states."

PERSONAL

Geo. A. McKinlock, president of the Central Electric Company, Chicago, has recently returned from an Eastern trip.

C. R. Messener of Minneapolis has accepted the position of manager of the Wadena (Minnesota) telephone exchange.

Henry Davis of Tilton, N. H., has been appointed superintendent of the Citizens' telephone system at Tilton and Franklin, N. H.

Gano S. Dunn, chief engineer of the Crocker-Wheeler Company of Ampere, N. J., has just returned home from a trip across the Atlantic.

W. L. Haskell of Springfield, Ohio, has accepted the position of manager of the Minnesota Valley Telephone Company at Mankato, Minn.

R. H. Soule, mechanical engineer, has opened an office at 29 West Thirty-fourth street, New York city, as consulting and designing engineer.

F. E. Rotchka has recently associated himself with the Stromberg-Carlson Telephone Manufacturing Company and is now connected with the Chicago office.

William C. Andrews of New York has accepted the position of engineer of the sales department of the Stanley Instrument Company, Great Barrington, Mass.

N. H. Holland, the well-known telephone engineer, has resigned from the Couch & Seeley Company and is now with the Holtzer-Cabot Electric Company at Brookline, Mass.

R. H. Gibboney, manager for the Rockford (Illinois) Home Telephone Company, was recently chosen secretary of the Independent Telephone Association of Northern Illinois.

Frank T. Craven has resigned his position with the C. J. Field Conduit Company to represent the American Conduit Company, 170 Broadway, New York, Chicago and California.

W. W. Bostwick, Jr., formerly with the Lambert Schmidt Telephone Manufacturing Company, has been appointed New York manager for the Couch & Seeley Company of Boston, Mass.

A. Frederick Collins has taken space in the Electricity building at the St. Louis Fair, to exhibit his apparatus for wireless telephony, etc., which has aroused a good deal of public interest.

W. J. Camp, superintendent of the eastern division of the Canadian Pacific Railroad Company's telegraphs, has been appointed chief electrical engineer to the whole telegraph system of that company.

Prof. J. M. Humer of Pawnee, Ill., has purchased the Divernon and Chatham telephone systems. Both exchanges are located in prosperous sections and the entire territory will be covered and service greatly improved.

J. B. Hoge, secretary of the Federal Telephone Company, Cleveland, Ohio, has been made general manager of the entire Federal properties and will succeed Mr. Maxime Reber, who will enter business in St. Louis. Mr. C. Y. McVey, at present manager at Youngstown, will become assistant manager of the Federal company. Mr. W. F. Crossley, superintendent of the Columbiana county system, will also have charge of the Youngstown system. Mr. O. F. French, for some time acting manager of the Cuyahoga Telephone Company, has been made general manager of that company.

C. O. Harris, formerly superintendent and engineer of the Rochester (New York) Telephone Company, has associated himself with the sales department of the Stromberg-Carlson Telephone Manufacturing Company and is now located in Chicago.

Dr. C. F. Bennett of Waterloo, Iowa, who is well known in the field of Independent telephony, has recently retired from the business, having sold his interests in the United States Telephone and Telegraph Company. It is expected that he will return to the practice of medicine, at which he was successful before engaging in telephony.

Hon. James M. Thomas, past president of the Independent Telephone Association of the United States of America, and long a leader in the Independent telephone movement, has, we regret to state, been quite ill lately, having been confined to his bed under the doctor's care. He is now convalescent and expects soon to resume his professional duties.

O. Morsman, who has been engaged in the telephone business for the past nine years and who has built exchanges in the southwest, has accepted the position of general superintendent of the Independent Consolidated Telephone Company of Wisconsin. Mr. Morsman is well known in Michigan and the east, where he formerly had a position with the United States Telephone and Telegraph Company. His Wisconsin headquarters for the present will be Dodgeville. He will have entire charge of the construction work and supervision of the operation of the system controlled by the Independent Consolidated Telephone Company.

Julian S. Jackson has become sales agent for Pass & Seymour, Inc., in Chicago, taking the place of Mr. John W. Brooks. The latter now becomes sales manager at Solvay, N. Y., headquarters. Mr. Brooks has been representing this well-known porcelain product in Chicago for nearly six years and covered from that point a territory including some eighteen states. Prior to this connection Mr. Brooks was with the Brooks-Follis Corporation of San Francisco, so that his acquaintance with the electrical industries is of long standing. Under the new regime he will relieve general manager Salisbury of part of the work due to the rapid growth of the concern and will, of course, supervise the sales agencies throughout the country. Mr. Brooks is fully equal to the new responsibilities and in his larger and even more comprehensive sphere of action will have a better opportunity to display the sterling qualities that have made him so many friends and won for him so enviable a reputation all over the West. His association with Mr. Salisbury at headquarters should prove a further step in the widespread popularization of the P. & S. product.

The director-general of the national telegraph and telephone systems of the republic of Panama is in the market for telegraphic and telephonic material. He would be pleased to receive catalogues descriptive of this material, as the national government is reconstructing the systems throughout the whole country, and would prefer to buy American material. One of the essential elements of the construction in this country is cheap iron poles to carry one or two telegraphic wires. The director would be glad to receive ideas as to costs, weights, etc. Iron poles must be used, because, when the big plains are burned during the summer, the bases of wooden poles burn through. Prices are also asked on telephone cables. The address is: T. T. Leferve, director, general, post office box 290, Panama, Republica de Panama.

Telephone Systems

C. J. H. WOODBURY.

When one removes the telephone from its hook and presently holds conversation with another in the same building or in a distant city, there is set up a train of action possible only under the concurrent action of science and handicraft, labor and capital.

It may be worth while to trace some of these steps and the results to which they are tending in modifying methods of life in business and personal affairs.

Your consideration is asked for the telephone system rather than for the telephone as an instrument, an invention which is the most delicate piece of philosophical apparatus yet made by man in that it is operated by less energy than any other device.

The telephone system ministers to the needs of civilization in lengthening the potent life of mankind by the utilization of time.

The telephone differs from all other electrical devices in that it is the only electrical appliance which does not require skill on the part of its users. It is equally the servant of all, a polyglot it speaks all languages and acts as a faithful messenger for the whole gamut of sounds.

It transmits in miniature the infinitesimal overtones which indicate the character of sounds, the individual quality of a voice or the source of a tone, through the whole range of vibrations far beyond the limits of the human ear.

The telephone would have remained a piece of physical apparatus, an example of the correlation of forces, an instrument to aid in the study of sound and a wonder to all, had it not been for the invention of the switchboard and the development of the telephone system of which it formed the essential nucleus.

Invention is a practical result in the victorious solution of a new problem and not a futile attempt or a passing wish.

Humanity has always desired to add to the potentiality of the voice by attempts to extend the range of utterance.

The masks of the Grecian actors, speaking tubes and stringed diaphragms were of as little purpose as signal fires, tomtom beats and semaphores, and the full measure of the strength of the invention of Alexander Graham Bell is shown by the fact that the telephone stands as the only successful result after centuries of effort.

EARLY ATTEMPTS AT TRANSMISSION OF SOUND.

The endeavor to communicate sounds by vibrations is not a new one, the string telephone being described by Dr. Robert Hooke in his book on "Ontacousticons" in 1667; but over a century earlier the transmission of vibrations to a diaphragm was applied during the Second Siege of Rhodes in September, 1552, as related in the history of the Knights of Malta by Major Whitworth Porter.

In this siege the Turks sunk shafts and drove galleries beneath the principal bastions. Gabriel Martingo, a Venetian engineer, in charge of the fortifications, excavated pits into which he inserted long rods, against the upper ends of which he placed a drum, and the vibrations of the earth in the tunnels made by the Turks were transmitted to this drumhead, which enabled the knights to determine their location and to sink countermines and destroy the advance of the enemy in this manner.

As an example of the wish to extend the limits of speech by means of electricity reference is made to *Harper's Magazine* for June, 1867, where it is related on page 131 that after a telegraph office was burned an instrument was temporarily installed in a carpenter's shop.

One noon the instrument clicked vigorously, and the carpenter placed his lips to the instrument and shouted, "Operator's gone to dinner; be back in half an hour," meantime receiving a shock in his lips which served for remembrance.

This man had the desire, thought and conception in his endeavor to apply electrical apparatus to the transmission of speech, but he did not accomplish his purpose and failed to produce an invention.

THE TELEPHONE CIRCUIT.

Before tracing the operation of the events set in action by the removal of the telephone from the hook, let us follow the lines from the instrument to the switchboard in the latest type of the telephone system.

On the way from the subscribers' instrument, if any portion of the wires are aerial, protectors are inserted in the line for the purpose of defending the instrument against other electrical currents imposed upon it by possible contact between telephone wires and those of electric lighting or power circuits or even lightning, any of which would disarrange the delicate wires in a telephone, some of which are so fine that three and nine-tenths miles would weigh a pound, and these protectors are so sensitive that they would shut from the telephone the battery currents used in telegraphing; and in like purpose the other ends of the lines at the telephone central stations are equipped with protectors to exclude the whole range of electric currents applied for lighting, power, the numerous signaling systems and also lightning.

One form of apparatus in use consists of a device inserted in each line wire which is three-fold in its nature.

This first element consists of a fuse made of an alloy which forms part of the circuit and is contained in a tube of vulcanized fiber. These fuses will deflagrate when exposed to currents seven to ten amperes, the capacity of the fuse being varied according to the type of the apparatus.

The next element consists of a pair of small blocks of carbon, whose larger surface measures about one by one-half inches and is connected to the telephone circuit. The corresponding block of the pair of carbons is separated from it by a perforated sheet of mica and is electrically connected with the earth. A small cavity in one of the opposite faces of the carbon is filled with a button of solder, such as is used in automatic sprinklers, and which melts at 165 degrees Fahrenheit.

The distance between these carbons is such that electricity at over 350 volts will pass from the carbon connected with the telephone circuit across this space to the opposite carbon and thence to the earth, thereby relieving the telephonic apparatus of electric tension exceeding 350 volts.

Thus if the foreign current exceeds the carrying capacity of the tubular fuse its deflagration opens the circuit at that point. If, however, it is less in volume than the carrying capacity of the fuse, and over 350 volts tension, it leaps across the thin space separating carbons, and thence passes to earth. The resistance of the tiny arc in the space between the carbons is sufficient to slightly warm the carbons and cause the fusible metal to flow from its recess and fill the space between the carbons and thus establishes a conductor of low resistance to earth.

This diminished resistance generally causes a sufficient increase in the current imposed upon a line to cause the tubular fuse to deflagrate and open the circuit, if it did not do so on the first occurrence of the contact which imposed the foreign current on the telephone circuit.

In order to protect the fine wires of the telephonic ap-

paratus from injury by currents which are too small to operate the tubular fuse, and of too low tension to pass to earth through the carbon cutouts, a third element, known as the heat coil, is employed, in which a fine German silver wire which forms a part of the telephone circuit will be heated by a current of one-sixth of an ampere to a temperature sufficient to release a conductor ordinarily secured by fusible solder, and pass the current to earth. This latter device is not used at the subscribers' end of the line in those modern types of telephonic apparatus in which the circuit is normally open, except when the telephone is in use, because such coils are an interference with the best conditions of telephone service by adding to the electrical length of the line, and if a foreign current came in contact with the telephone line at a time when the instrument was in use, it would produce noises to such an extent to absolutely prevent the transmission of speech, and the user of the telephone would naturally place the receiver on the hook and thereby open the circuit.

The result of this protective apparatus where it is used has been so successful as to establish conditions of immunity against mishaps to the apparatus resulting from foreign currents and lightning. Such a telephone office appears to be, like a locomotive, the safest refuge in a thunder storm. Notwithstanding the number and range of location of telephone central stations, it has not been possible to obtain information of any injury by lightning to any person in such a place.

TELEPHONE LINES.

Following the course of the lines from the subscriber's instrument, the aerial wires are of copper, which are treated by the hard-drawn process. Commercial copper is too ductile and has but little of the elastic property of resilience by returning to its original length when stretched by a load of snow or by a low temperature.

Hard-drawn copper might be classed as one of the modern inventions which the ancients stole if the accounts of early implements may be accepted, but investigations showing that bronze had been supposed to be copper have absolved these people of anticipating the work of Mr. Thomas B. Doolittle, who produced hard-drawn copper by omitting the annealing during the latter part of the process, and obtained copper wire which retains the electrical conductivity of commercial copper, while its tensile strength is doubled, and it is divested of the tendency to continually stretch under its own weight.

The substitution of hard-drawn copper wire for iron wire formerly in use has increased the limit of telephone conversation under other equal conditions about four times, and by its better conductivity has diminished the waste of electricity used in telegraphy or electric lighting and transmission of power, or what has been more important, has extended the limits of their application.

For local use these wires are generally one-tenth of an inch in diameter, and for long-distance lines larger wires about one-sixth of an inch in diameter are used.

The contact of these wires with those of other electrical circuits for lighting or for power to which reference has been made is not the one difficulty, for the mere proximity of other wires conducting these powerful currents will, if they are of changing polarity, produce sympathetic currents by induction in the telephone wires, and acting on the telephone are the occasion of various noises which at times interfere with the transmission of speech through the telephone, furnishing examples of wireless telephony which are impediments to the usual service.

This interference by induction is minimized by transposing the telephone wires to various positions on the cross arms, so that the result will be neutralized by imposing such conditions of position that these disturbing elements will counteract each other.

Underground cables are in twisted pairs so that they are immune to inductive influences.

An aerial line is subject to the attack of all manner of disintegrating conditions. Poles decay and break, branches fall from trees and wreck the wires.

It is as unfeasible to make a pole line equal to stress of weather beyond peradventure as it is to make the rigging of a vessel equal to the impact of all storms, for when a sleet storm builds the wires to icy lines three inches in diameter, sail is set for the gale to sway the lines until the poles or wires are broken.

During a recent winter the destruction of aerial telephone, telegraph and electric light lines in New England was estimated to be greater than the loss by shipwreck on the New England coast.

Every possible precaution must be taken to avoid contact between high-tension and signaling lines, and prevent the occurrence, rather than to rely upon protective devices to defend the plant against physical injury, because the operation of a protector suspends the service over that line for the time being.

At cross-overs it is preferable that the high-tension line should be above, as its wires are of larger diameter and generally fewer in number than the signaling wires.

The simplest method to prevent contacts in such positions is to make the upper span so short that the radial distance from the lower wire of the upper span to the nearest wire in the lower span is less than the width of the upper span; and then to dead end wires to prevent overhauling in case of breakage occurring on adjacent spans.

In many instances this method of line construction is unfeasible, because the poles for such a short upper span would interfere with the requirements of travel in a highway, and other methods of preventing contact in case of breakage must be adopted, usually by guard wires connected by slots secured transversely across them.

When different lines are parallel to each other the distance between them should be so great that the higher line could not touch the wires of the lower line if it fell toward it.

In all cases when high-tension and signaling wires approach each other every precaution should be taken to provide against possible contact by the use of heavy material in construction and guys and braces to the poles as may be needed to assure their stability in order to prevent occurrences which would interfere with the continuity of the service.

The aerial lines pass from the poles into underground conduits in the congested parts of cities, flying from the mishaps of storms and crosses to other difficulties which are largely those of greater expenditure and electrical problems.

Conditions of safety and good service require that a telephone underground system should not also include lines of electric lighting and power circuits, and serious mishaps have occurred in the few instances where the attempt has been made to place these diverse types of electric circuits adjacent to each other in the same underground system.

The underground system is older than the aerial system of electric conductors in applied electricity, for a portion of Morse's invention of the telegraph consisted in methods of burying the wires, but the first seven miles from Baltimore laid underground in lead pipes placed in a plough furrow was inoperative.

When a foreman on the work, because he could not bury the wires along the stone viaduct at Relay Station, placed them on poles with cattle horns from a neighboring slaughter house as insulators, the expedient proved so successful that the remainder of the line to Washington was built in this manner, and the first portion reconstructed.

The underground conduits consist of groups of continuous ducts, generally three inches in diameter, and made of vitrified tile, cement monoliths reinforced with iron, or cre-

osoted timber, and every few hundred feet these conduits lead to an underground chamber for the purpose of obtaining access to the cable to provide for branches to the service of patrons and also joining the ends of sections of the cables together.

These underground cables generally consist of about two hundred twisted pairs of wires insulated with paper and the whole covered with a lead sheath.

The electrical difficulties of telephoning through underground conductors were at first prohibitive in their nature, but improvements enabled this to be done later, but in the face of conditions which rendered one mile of underground the equivalent of fifty-two miles of overhead wire; but in the modern cable one mile of underground is the equivalent of twenty-eight miles of overhead copper wire one-sixth of an inch in diameter, or twelve and a half miles of overhead copper wire one-tenth of an inch in diameter.

These conditions are so severe that on long lines it is necessary to pass around intermediate cities to avoid underground wires, and in the suburbs of large cities are switching stations by which connections may be provided to send their messages by branch lines direct into the cities or permitted to continue on the main line to places beyond.

The terminals of the underground cable at the telephone central station emerge from their lead sheaths and are spread out upon a large iron rack known as a distributing frame, where the insulated wires are equipped with protectors for the same purpose as those at the subscriber's instrument, and the wires are changed from the order in which they are received from the cable to another classification, and thence to a similar rack called the intermediate frame, where the wires are grouped to the individual operators, which latter arrangement may be changed from time to time, as the number of telephones to which an operator can give attention varies according to the character of the service; that is, a business house conducting much of its affairs by telephone uses many messages a day and requires more of an operator's time than a residence with its infrequent use of the telephone.

The grouping of the use of the telephone may well serve as the basis of a sociological study of the habits and customs of a community, but for studying the conditions of service for which provision must be made the number of communications each hour of the whole day is taken from time to time, and the result plotted in a diagram whose hills and valleys indicate the relative load of service on the system.

In all cases the night use between 7 p. m. and 7 a. m. is a small proportion of day use, and while these calls are largely of the important nature of emergency calls for fire department, physician or police, yet in number they are slightly over one per cent of the calls of the whole twenty-four hours, but the calls during the day begin to increase suddenly at some hour in the forenoon after the morning mail has received attention, and approaches the congestion limit in the middle of the day, falling off suddenly as offices are being closed and resuming activity in the larger cities late in the afternoon when arrangements for dinner or theater are being made.

In the west the general business day is longer than at the east, while in New York the plotted diagram indicates by the short duration of the extremely busy period that many might avail themselves of Charles Lamb's excuse to the bureau officer in the East India Company's office and make amends for being late at their desks in the morning by leaving earlier in the afternoon.

The short time taken for lunch, or indeed its omission in New York, does not make a sufficient break in business affairs to produce a depression in the curve, while in another city the depression is so great as to suggest a noonday dinner at home, perhaps followed by a nap of forty winks.

THE SWITCHBOARD.

The function of the switchboard is merely to place the ends of the wires from one telephone in electrical contact with those of any other telephone in the exchange, with suitable signals for calling the operator and the party addressed, and this system has been amplified until one human voice can reach to districts including considerably more than half of the population of the United States; and the interlacing has been so complete that its service reaches the smaller villages.

The first switchboards were based upon the telegraphic device of placing any two of half a dozen lines in contact, and the further development merged the principle of the annunciator used in hotels or in passenger elevators, in which a falling target or shutter, called in like manner, the attention of the operator. With the needs of the patrons the switchboard grew, new features were added and old methods became discarded; every conquest of improvement meant an abandonment of former devices.

In these new switchboards the dropping shutter has been supplanted by the flash of a lamp to signal the operator; the turning of a crank to generate a current for moving a shutter is no longer necessary, and the subscriber removes the telephone from the hook and is ready to begin; galvanic batteries are not installed at the subscriber's equipment, but the whole of the electric energy is supplied by storage batteries at the telephone central station.

When the subscriber removes the telephone from the hook, which is merely an electric switch arranged to be operated in this manner without conscious effort on the part of the subscriber, a small electric bulb about the size of the end of a lead pencil and imbedded in the switchboard becomes illumined with an opalescent glow, which attracts the attention of the operator, who inserts a plug at the end of flexible conductors into a small socket perforating the face of the switchboard just below the electric light, and this corresponds to the telephone of the subscriber, and the socket guides the plug to contact with the ends of the wires from the subscriber's telephone, and the insertion of the plug in the socket also extinguishes the signal light.

A touch upon an electric key places the operator's telephone in circuit with the telephone of the subscriber who hears the inquiry for the number wanted.

On receiving directions, the operator inserts the plug at the other end of the same flexible conductor into the socket corresponding with the telephone wires of the party desired, and this lights one of a pair of signal lamps imbedded in the table projecting from the front of the switchboard.

If, however, the operator hears a click on inserting the second plug, this serves as a signal that the desired line is in use elsewhere on the board and the line is reported as being "busy." It is more personal trouble for an operator to report a line as being busy than it is for her to complete the connection.

When the party called to the telephone removes the instrument from the hook to receive the message this light on the table becomes extinguished. After both persons have finished talking the hanging of their telephones on the hooks flashes the pair of lamps on the table, which glow until the operator, perceiving the signal, pulls both of the plugs from their sockets.

If, instead of a subscriber at the same switchboard, one is desired at another exchange, the proceeding becomes more complicated, and many of the arrangements of the modern telephone central stations and methods of administration are designed to provide for this extension of the service.

When such a call is received, as the operator cannot reach a line directly to the desired telephone, the call is transmitted by an office line to a special operator at another switchboard, where it is noted on a memorandum blank and the time automatically recorded by means of a clock registering stamp; then the call is transmitted by trunk lines to

the desired telephone central station, or it may be to some station which can reach the desired subscriber, and in some instances it is necessary to transmit the message through a greater number of telephone offices, each one building up the line by additions, and every operator also keeping by means of the time stamp or memorandum blanks a record of the hour and minute of each step from the initial call to the final termination of the conversation and the release of the lines.

These memorandum blanks are compared by clerks and must balance as in other bookkeeping and form the authority for the charge for the service. In some instances, where there is a great load of service on long distance lines, the communication from one central station to another by the operators for the purpose of obtaining the desired party at the other telephone is carried on by telegraphing over the telephone lines; for there are methods by which this can be done without interfering with the transmission of conversation at the time on the identical wires, and these lines branch near to their terminals where each class of electrical currents is transmitted to its proper instrument, whether of the telegraph or the telephone system.

A telephone switchboard is an exception to general forms of construction in that the cost per unit increases at a greater rate than the enlargement, and this is due to the fact that, as the operator who receives a call from a subscriber must be able to reach the terminals leading from the switchboard to any other telephone or to the switchboards at other stations, and therefore each set of telephone wires must have as many sockets and branches as there are operators' sections at the switchboard.

For example, in a small switchboard with two operators' sections, there would be two sets of such branches and sockets for each telephone line, while in a large switchboard with fifty operators' sections, there would be fifty sets of such connections for each telephone line instead of two sets mentioned in the first instance, the number of this class of connections multiplying twenty-five times for each telephone.

This increase of complication of detail growing upon itself would reach a prohibitive cost in large cities had it not been found feasible to depart from the original plan of one central telephone station in each city and to introduce a modification by apportioning large cities into telephone districts, each with its telephone station connected to the others by numerous trunk wires.

There are other precedents in construction when an increase in size adds disproportionately to the cost, as bridges, where the expense of a larger span is disproportionately greater than a smaller one of equal strength; and in like manner large pipe organs cost more per unit of capacity than smaller pipe organs.

A telephone switchboard is a marvel of complexity of detail in extreme contrast to the simplicity of operation, and no one person can have the repute of its design, but it is one of the few inventions which were made by the concerted effort of many experts working together for a purpose.

The mechanical intricacy of the modern switchboard may be well appreciated by the fact that, even with present methods of special machinery and the organized application of skilled artisanship, it requires as long to make and install a switchboard as it does to build and equip a merchantman, the time being from one to over two years, and the cost of the central station plant may reach $1,200 per foot of length for the larger switchboards, and perhaps half that cost per foot for a switchboard adequate for a city of 50,000 inhabitants.

These central station costs are a small detail of the whole cost of the system, although it is the greatest concentration of value and forms the vital part of the whole exchange.

There is an exaggerated opinion of the damageability of a switchboard by water, and while it is perfectly true that it must be thoroughly dry for practical operation, yet switchboards have been thoroughly wet and restored to good service by drying out. It is the general custom to provide waterproof covers for switchboards as well as for generators and motors whenever it is considered that there is any hazard of a water damage from fires in other parts of the building which might cause an interruption in the service.

One of the floating statements which probably originated among the wheels in the head of some man set to the task of filling a funny column runs to the effect that a glass of water would cause $1,000 damage in a switchboard, and the statement is absolutely a false one.

When a switchboard is started in the service the elements of its active demolition begin; repairs and adjustments are necessary, extensions become needed for increased capacity, wear and tear has been outclassed by the more iconoclastic depreciation from subsequent invention, and in a few years the old board becomes obsolete and the expensive apparatus is burned for the intrinsic value of the copper which it contains.

THE SWITCHBOARD.

The telephone business in its complications on one hand and its close relations with the needs of its patrons on the other is one requiring active zeal.

As a certain French prisoner in the Bastile could always see an eye at a hole in an upper corner of his cell following his every movement, so with as vigilant, although more agreeable espionage, there is always an ear waiting at the office end of a telephone line to take the directions of the subscribers in giving service.

Under American conditions the equipment of the plant and its attendance must be adequate to give practically instantaneous service at all times, even though the demands at night are but slight in comparison to the requirements of the day.

The striking feature of the two great applications of electricity which are used by the public—namely, the street car and the telephone systems—is that, however complex their mechanism, their use is extremely simple.

There is, however, no premium on ignorance in the use of the telephone either by subscriber or operator. It has been a matter of slow growth for the subscribers at large to use the telephone in the best and simplest manner, and that is to speak clearly rather than loud, and to avoid the use of unnecessary words in calling for the number wanted.

Operators are prepared by a short course in a special training school, which differs from other institutions of learning, except West Point and Annapolis, in that they are under pay during the period of tuition. The result of such systematic work in connection with improved apparatus has reduced the time of making complete local connections in a large city during the last five years to three and nine-tenths seconds, which may appear a short time to any one, except when waiting at a telephone or looking at a gun, but this small amount of time when applied to all the telephone connections in the United States amounts to thousands of hours per day saved to the subscribers' time. The saving of time in disconnections, largely owing to the common battery switchboard signaling the operator by lights rather than shutters, enables the lines to be released when a conversation is at an end three and two-thirds times as rapidly as formerly, and this is of great advantage to the subscriber in making repeated calls.

Why wonder, then, that conversations, concentrated for the most part in the middle of the day, sometimes interrupt, and "the line is busy—please call again."

This interruption has been largely diminished of late years, first by the use of two telephones by subscriber, one being omitted from the telephone book, so that it is not subject to interruption by calls, and this instrument is therefore always free for use by the subscriber.

The second step in the development of the use of the telephone is an example of the modern principle of the con-

duct of business affairs in the subdivision of matters, so that each element may be attended to by one excelling in that branch; and in telephony this is done by concentrating the lines from the several telephones in an establishment to one desk, where, under the service of a skillful attendant, the desired connections are obtained.

This concentration reduces the number of lines from the telephone central station to this group of telephones, and, while the commercial advantages of the method are so apparent that the number of these private attendants in some cities is more than twice the number of telephone central station operators, yet it must be obvious that there is an advantage in this arrangement, for as everything has some relation to the fire hazard, that of the telephone is based on the exposure of the wires leading to the subscribers' instruments to foreign currents, and if the number of these wires can be reduced from a pair leading to each telephone, down to two or three circuits leading to a normally open switching arrangement, which in turn can connect to any of these telephones, then the chance of occurrences resulting from foreign current is in like manner minimized, without reference to the defense afforded by the protectors.

Furthermore, the entering wires are equipped by protectors, as may be required, near to the entering point; and the whole group being under the care of an experienced attendant, better service can be obtained, as in case of any interruption to one circuit some other circuit can be used to call for necessary repairs.

This interruption to service has been reduced to a very slight matter, and this is generally owing to an enlargement of the plant, where the changes are made at night. The subscriber to a telephone loses personal identity and his name merges into a number.

When telephone central stations were first established the names and positions on the switchboard of the subscribers were known to operators with strong memories; an epidemic of measles occurred in such a town and a physician on the board of directors viewed with alarm the possible condition of affairs if more than two of the four operators should be taken with the measles, and proposed that the subscribers should be numbered.

His associates demurred, as they were of the opinion that the subscribers would give up their telephones sooner than submit to the indignity of being known by number, but in view of the contingency of the service being paralyzed they finally yielded, and to the surprise of all, the new arrangement was cheerfully accepted by the subscribers, who appreciated the improvement in the service which resulted from the change.

Essential as the telephone is now to the conduct of affairs, no one can state, except as a general principle, why a person subscribes for a telephone. While a large town uses more than a small one, the ratio of telephones to population differs materially in various places to an extent beyond what may be attributed to the personal energy of those in charge of local affairs; and in like manner the relation of the number of telephones to the number of horses, electric lights, business houses, assessed valuations or any other of the details of census enumeration fail to give any basis of close comparison.

However, there are several lines of general similarity which cannot be tabulated in the logic of numbers. Where highways are bad there is a large amount of toll line telephone traffic. A hilly town uses far more telephones than a similar one on flat territory, and in some particulars one in a warm climate appears to give more patronage than a similar town in a cool climate.

In the use of the telephone there is originally one element of surprise to be mastered. The senses are co-operated in their relations with each other, taste is rendered more vivid by smell, sound and sight accompany each other; with the use of the telephone there has been need of practice to accustom one to the sound of a voice through the telephone without the help of other senses to determine its position which may be near or far.

The Arab proverb, "Speak, that I may see thee," does not apply to the telephone. The impersonal question and its rebounding answer is developing methods of concentrated mental effort, which are adding to the potentiality of the individual.

The telegraph is not adapted to the transmission of the Chinese written language, and messages are necessarily translated into some modern language, and after receipt interpreted back into Chinese.

The telephone can be used by Chinamen who understand each other's dialect, of which there are about seventy-five varieties in China. There is a Chinese switchboard in San Francisco, at which the operators must know the four principal dialects of the provinces which furnish the immigrants to this country.

The telegraph has made correspondence more concise and checked the tendency to "degenerate into fine writing"; the typewriter is bringing the spoken and written English, for the Chinese have not the monopoly of dual languages, and the telephone is making direct and definite propositions and replies in the three minutes between the hello and good-bye.

Like Queen Victoria's published diary, it has given sanction to colloquialisms, and even slang, and imported to words new significance not stated by the dictionary.

It appears that these changes originate with the subscribers rather than the telephone companies; for instance, a telephone central station is generally referred to as an exchange, while a telephone exchange according to its use in patents, contracts and by courts is the telephone plant within a circle of thirty miles in diameter, for the original concessions of the telephone company were like the Spanish land grants in the western hemisphere, except that the circles do not overlap, nor are their centers moved at the will of the stronger holders.

In order to make every feasible provision for the permanency of the telephone service the buildings erected by the telephone companies are, with the exception of a few with mill floors, entirely of fireproof construction, and the designs are especially made with a view to obtaining stability under heavy loads and to afford resistance to fire. They are equipped with subsidiary fire apparatus and the windows opening toward exposures are provided with fire shutters.

In smaller towns, where special telephone buildings are not warranted and it is necessary to lease space for central stations, the utmost care is exercised to select the best buildings available for the purpose, and these are generally that type of building well known in small towns where the first story is occupied by a national bank one side of the front entrance, and a savings bank or the postoffice on the other side.

There is a general inspection of central station property which includes reports on general order as well as matters pertaining to the service and the conditions of the electrical apparatus.

In addition to night watchman's patrol on such properties, notwithstanding the constant occupation of the operating room, there is a constant supervision of the central station apparatus against all disarrangements, which is equal in the larger central stations to an inspection of the plant.

Wires are placed underground in cities, some of the apparatus is in duplicate, and reserve portions are stored at convenient points and the operation of the whole plant is under a constant supervision. The electrical apparatus is frequently tested, inspectors patrol along the route of aerial lines, trials of service are made at subscribers' instruments and the apparatus examined in addition to electrical tests made from the central station without the subscriber's knowledge. Even the electrical condition of the earth as

modified by the return currents of the electric railroads is measured.

MISCELLANEOUS APPLICATIONS.

The telephone habit is causing subscribers to use their telephones a greater number of times each day, and circumstances are finding new uses, which in turn become grafted into the system.

A few years ago, when the steamship St. Paul was stranded for a few days on the New Jersey coast, a man rowed out to the vessel with a telephone set attached to a twisted pair of waterproof insulated wires, which served as a submarine cable, which connected to a telephone line on shore, and officers and passengers used the line until the boat was pulled into deep water and finished her voyage.

From this was but a step to the present custom of connecting steamers by telephone while they are lying at dock, and this may have been anticipated by the practice of connecting fire boats by telephone when they are moored.

Express trains at the west are frequently connected by telephone at stations where there is a stop for a few minutes; and the trolley cars of long lines in Ohio have telephone booths. The cars of the funicular railroad on Mount Tom, near Holyoke, Mass., are equipped with telephones, connected by sliding contacts to a pair of wires at the side of the track, so that the motormen on the two cars can communicate with each other.

Railroads, particularly trolley lines, are largely managed by telephone, and the installations at large terminal stations are on an extensive scale.

Wrecking trains are equipped with telephones, which can be connected with a telephone line along the right of way and communication established with headquarters of the company.

Business meetings and conferences are held by means of telephones, which are joined together in such a manner that the whole number, instead of merely any two, can hear what any one says.

In hotels the telephone is used for calls from rooms to the office, obtaining quicker and more accurate service than can be secured by waiting for a bell boy, by whom the message may be forgotten or distorted, and these room telephones can also be used throughout the general telephone system.

Oaths are administered over the telephone; it is against the rules of the company to utter them. Threats are made from the safe vantage of a sound-proof booth, and lawyers have been at variance as to alleged libels in the same manner. That lovers woo and swains propose over the telephone is an everyday remark, but a young man in Muncie, Ind., had some difference with a miss and was shown the door with the injunction never to call again. Asking permission over the telephone to call again, her reply was to fire three revolver shots into the transmitter, so that the young man had good cause to remember that absence of body was preferable to presence of mind.

Telephone lines penetrate mines, extend through air locks of tunnels and caisson foundations; they ramify about extensive manufacturing establishments and form part of the equipment of vessels; they accompany the advance of armies and the commander is kept in communication with the firing line. In short, its applications are becoming more extended as the emergency of yesterday becomes the precedent of to-day.

The electrical transmission of speech and its instantaneous reply is the last step in the progress of modern enlightenment in that concentration of effort and result which reaches to every phase of life in its modification of commercial and personal relations between individuals isolated from each other's presence.

The Telephone Mail

E. I. LEWIS in the Saturday Evening Post.

And now it is proposed that Uncle Sam deliver the American farmer's "rush mail" to him by telephone. "Rush mail" —what is this marvel-working twentieth century doing with the farmer, anyway? Content, scarce a brief half-decade ago, to drive to the postoffice once or twice a week for his Thursday paper and the neighborhood's mail, he now finds the daily rural mail delivery to his door far too slow. Why? Because 600,000 little bells are ringing in 600,000 American farmhouses. They summon him and his household to put ear to the rail over which the commercial world is madly rushing. The bells, the tinkling, tinkling, tinkling of 600,000 little telephone bells, that next year may reach 800,000 and then a million, have quickened his blood.

And thus it happens that a proposal will be made to this congress for the government to quicken his mail and include the latest marvel of agricultural America in mail distribution facilities. The proposition that in any other country and any other age might be regarded at arm's length as a dream will be laid before congress by Senator Charles W. Fairbanks, whose state—Indiana—was the first experimenting ground for rural mail delivery and is now almost covered, to every farmhouse door, with the service. As he terms it, his bill will be one for "rural telephone delivery of special mail matter by telephone." He will ask an appropriation sufficiently large to afford a thorough experiment covering one or two years. Simultaneously with the filing of his bill the farmers in his state will offer the government the free use of lines reaching 24,000 farm homes in Indiana. Similar offers will come from Illinois, Iowa, Michigan and other states that are well covered with rural telephone lines. It is thought that at least 100,000 farmers' telephones will thus be placed at the disposal of the government for a period of one or two years' experimentation. The farmers will also show their deep interest by giving assurance of rates for permanent service that will make it practicable for the government thus to extend its ten-cent special delivery fee to the country districts.

THE PLAN BEFORE CONGRESS.

Senator Fairbanks' plan is decidedly simple. "We have," he says, "a special mail delivery service for towns and cities, extending to their corporation limits. Though the establishing of such a service was regarded, when it was proposed, with a great deal of apprehension, it has not only proved to be one of the most popular features of the mail service, but last year it netted the government $167,727.73. I would simply extend this service beyond the town and city limits, using in delivery in the country the telephone instead of messengers. It is my opinion that the telephone will prove a more efficient messenger boy than the one we have in the cities—it will be quicker and cheaper. A special delivery stamp, possibly similar in size to the present special delivery stamp, when placed on a letter, would be notice not only for the greatest haste to be used in getting the letter through to its terminal postoffice, but for the receiving postmaster to open the letter, step to his office telephone and repeat its contents to the person addressed, who may be ten, fifteen or twenty miles back in the country. The letter then should be delivered with other mail matter. It will not be necessary to limit the length of telephone letters—let there be one ten-cent stamp for every one hundred or one hundred

and fifty words. The service is not to be used where it would come in conflict with the present special delivery service.

"The farmers' telephone has come to stay, to expand, and to play an important part in our national life. It is true that it has not yet bound all states, nor even parts of invaded states, in its meshes; but in most progressive farming sections from Maine to California, and especially in the level Mississippi Valley where farmers raise extensive crops and realize that they cannot afford to be without close communication with the world and its markets, the lines have been run out from the towns over all country districts. It is not unusual to find a telephone hanging by the side of old-fashioned fireplaces in isolated log houses. Though many of the lines that have been built by the farmers themselves, and are conducted by them in person, may be defective, as viewed by an expert electrician, they afford reliable, quick, cheap service. Let the government give the farmer the special mail service that he, unintentionally, has been preparing the way for, and within a remarkably short time you will find a telephone in the country home of practically every patron of the government mail service. Would this be an advantage in our national life?"

THE SYSTEM AT WORK.

Though telephone delivery of special mail matter, as a national mail service, would be a step far in advance of anything in the history of mail distribution, it is by no means an idea original with Senator Fairbanks. The service will be given the farmers even if the government does not officially recognize it. It is now in practical operation in many of the rural counties of the central states that are covered with farmers' telephone lines. It is not uncommon, in these communities, for a farmer wanting a "rush" reply to a letter to direct that it be addressed to him care of the "central" of his farmers' telephone exchange. The "central" is directed to open such letters and repeat them over the telephone. By this method the farmer, who may be miles away from his post office, is often able to get a reply to a rush letter twenty-four hours in advance of delivery by rural carriers. Not only does this beat the rural mail delivery but, in many instances, it is found to be quicker than the telegraph. The telegraph service, as a general rule, is limited to a twenty-five-cent extra messenger fee, which seldom takes it far beyond the town.

It is not unusual in farming regions covered by telephone wires to find a farmer or his wife seated in an armchair and rocking quietly, with a telephone receiver clamped over his or her head and a small transmitter at hand. Perhaps it is the quiet enjoyment of a neighborhood call twenty miles away, perhaps "central" is reading from the evening paper, perhaps a graphophone entertainment, the music from a farmer's parlor in an adjoining county, or the effort of the band at the county seat, is being distributed over the entire country. Some of those delightful visions of the future that made Bellamy's Looking Backward so interesting are visions no longer for the farmer—he gets his news, his music, his entertainment delivered to his ear-drum.

When the telephone took to the country it left monopoly and monopoly rates at the town limits. Entire counties and groups of counties, giving talking service over fifty or even one hundred square miles, are covered "toll free," and connections are had into distant cities at greatly reduced rates. As for the telephone service—a service, by the way, that is satisfactory—what would the city man think of the statement that in some instances the farmers have it for $3—no, not a month, a year! That seems nearer the impossible than the statement that the government may deliver "rush mail" to the farmer by telephone. Nevertheless it is a fact. A large number of very successful farmers' "mutual" companies operate on $5 a year rentals or "levies"; a larger number on $8, a still larger number on $10, and in other communities the rates run up to $15, $18 and even $24. Nowhere, where the service is practical, is over $24 a year charged. These "high-priced telephones"—the $15, $18 and $24 ones—are operated by incorporated companies for revenue, and are discredited by "Independent farmers" as "company telephones." The "company telephone" hangs in the farm-house as the symbol of an octopus that does not look with favor on the promotion of social relations by telephone calls and entertainments. It is for business—to call the doctor, to order something from town, or for business conversations. The "mutual" or the "co-operative" telephone hangs on the social circuit of the county. And thus it happens that the "mutual" and "co-operative" telephones, though perhaps not so thoroughly up to date in equipment, have greater vogue.

The telephone took to the open fields just about six years ago. Where it first had its birth has never been decided. But wherever that may have been, its growth is told in the story of the new "mutual" exchange in any new territory to-day. A few farmers that are "seasoned-in" in the spring and "snowed-in" in the winter get together, go to the woods, cut their own poles, put them up along the road sides and, having bought wire, string it. They go into the open market and buy their own telephones—about one hundred and fifty instruments, in price ranging from five dollars up, are offered farmers—and probably engage a young man who has read a book on electricity to put them up, make the connections and inspect the line. In the beginning these lines generally run along one country road—a single strand of wire on which are hitched ten or twelve telephones. Each farmer, given a different ring, is his own "central." But this does not last long. The farmers along another road, after prolonged shakings of the head, hear what a good time the people along the line are having, and they build a similar line. Another and another and another is built, and finally the farmers on one line want to talk with the farmers on other lines; an understanding is brought about and the lines are all drawn into the central town and run into a room. A switchboard is bought, and a "mutual" or "co-operative" central is opened and a girl is placed in charge. Thus the lines are run through one town, and by a similar process they reach out to lines connecting into other natural centers, and thus, in a few months, the county seat is connected, and that county seat is connected with another and another, and the "free toll" service is extended. Then it is that these many companies, wielding great patronage, lay siege at the door of rival long-distance companies and demand, and get, exceedingly low rates on "business" or "connections" into distant points.

While this has been going on the farmers who built the first lines, as a rule, are not idle. They have found that, for the sake of sightliness, they should replace crooked poles with straighter ones and should put up cross arms to carry their wires. They find that their cheap instruments are not nearly so good as those that cost only a little more, that a single wire is not sufficient, and that ordinary steel wire is not nearly so good a conductor as copper. Little by little they make the changes, and the service is improved. The construction may cost all the way from $15 to $50, the service from $3 to $24 a year.

THE MARKET BY WIRE.

It occurs to some progressive farmer that he should know, every night, how the market closed. He speaks to a few other farmers and they subscribe for the evening city paper for "central" so she can tell them every evening. It is only natural, when they are all listening, that some one should ask: "Is there anything important in the paper to-night?" Of course there is—the headlines are read. Soon every farmer on the line, learning that "central" reads the paper over the line, makes it a point to have his ear to the receiver at the appointed time. Farmers' telephone lines are generally open a good part of the night whenever an election or a prize fight is on. Many communities not only rely on the

evening papers for weather indications but arrange for central weather bureaus to telegraph the new weather indications every morning to the local central, who repeats the prediction over the wires. A single "tip," coming at eleven o'clock in the morning, that "the thermometer will drop forty degrees to-night," often saves in a single night the cost of the telephone service for an entire year. Many a farmer who has prepared to drive his hogs to market the next morning has his trip advantageously postponed by the "tip," coming late in the evening, that "hogs slumped forty cents at the close."

In the rapid development of the telephone as one of the principal farm equipments some remarkable discoveries have been made by farmers who think. One of these, living on one of the wide Illinois prairies where there were no telephone poles to be cut, conceived the idea that, after all, the top strand of his barbed fence was wire—wire much the same as that stretched on poles in the cities. He insulated the wire at the posts, bridged connections over roads and fences by using uprights, or ran them under ground by using the ordinary drain tiles. He hitched on his instruments. Of course it "talked." "Hello, Central, give me Jones on the Hudgins road barb wire," is not an unusual order now.

Another farmer of inventive genius began to figure that if he could connect up all of his neighbors on a barb-wire fence, why could not he connect up himself, while at work in his fields, with his own farmhouse. He insulated the top strand of his fences, carried a portable telephone with him to work, hung it on a near-by fence wire and was always within call of his sitting-room. Thus it will be possible, in some instances, to deliver the farmer's "rush letters" to him in his fields.

Of course the unpretentious fence telephone gets severe jolts from telephone experts. Notwithstanding the operation of such lines, they declare that they are "impossible." But besides the farmer himself, the barb-wire telephone has one stanch friend of considerable note among telephone men. He is Alexander Graham Bell, father of the telephone. "Yes, it is practical," he said to me recently, "and I am glad to see it. It is a part of unwritten history, but the first telephone message ever sent was over a fence wire. It traveled eight miles over fences from my home in Canada to a small town. It was the birth of the telephone—the first practical telephone line. I am glad to see the wires come down to their lowly beginning. The farmers can do more than they have thus far done and connect up their woven-wire fences. Never mind about how the message would get over all of the wires and the cross wires. I can't tell you that, but it will pass through the woven-wire fence as freely as over the single strand of a barb-wire fence. Of course the woven-wire fence must be insulated and be kept free from ground connections."

The farmers' telephone is not only doing wonders in a social way among the farmers, but it is changing, materially, the farmers' lot. In some communities—New London, Connecticut, one of them—livery-stable men in the country towns are beginning to cater to "farm trade." It is told the farmer that he can sell off all of the horses he desires to sell and that he can order horses by telephone for one day, two days, one week, two weeks, a month or two, and that they will be delivered by the livery-stable man. The rates are reasonable. In many country communities the farmer is getting his provisions delivered to him. His wife can telephone her order before nine o'clock and get her delivery by noon, or in the afternoon. In some places light deliveries are made by the rural mail carriers, the orders being sent to the merchant before the carriers leave the post office at eight o'clock. In other places the merchants have joined together and put out delivery wagons, scheduling them over certain roads on certain days. Orders can be telephoned for these deliveries. The farmer who awakes with a start and the conviction that his horses have been stolen out of his barn need no longer rush out without his clothes on and risk being filled with bullets. He only has to walk over to his telephone and spend a few minutes organizing parties to block every road. Horse-thieving is a lost art in the rural telephone country.

The farmers' telephone has been run into a number of churches and the transmitter has been placed where the words of the preacher will be caught up and carried to the ear of a feeble member of the congregation lying prostrate in bed several miles from the church.

A priest has administered absolution over a farmers' telephone line.

The legality of contracts made over telephone has been established, and the identity of voices heard over telephone in this connection has been legally fixed. Courtships have been carried on over farmers' telephone lines and many marriages have resulted. In still other ways the telephone has brought the country people closely together, has been a great aid to them in their work, and has proven satisfactory. The farmer is satisfied with his equipment, though it may be technically defective when viewed by the expert electrician. He knows that it is practical and that it will be a valuable aid to the government in getting his "rush letter" to him in "rush time."

RURAL CALLS BY TELEPHONE.

In his article on "Life in the Corn Belt" Prof. T. N. Carver, of Harvard University, gives the following illustration of how the rural calls are made by telephone:

First Female Voice—Is that you, Sarah?

Second F. V.—Yes, it's me.

First F. V.—Have you got your dishes washed yet?

Second F. V.—No; we're just through breakfast.

First F. V.—What did you have for breakfast?

Second F. V.—Fried mush and eggs, and pork, and—say, what did you have?

First F. V.—Oh, we had graham gems! We're going to have roasting ears for dinner.

Third F. V. (breaking in; evidently some one else is listening, too)—So are we.

Second F. V.—Ours aren't ripe yet.

Third F. V.—We've got lots. Send Sammy over after them and I'll give you some.

Fourth F. V. (another listener)—Say, Mary, how is the baby?

First F. V.—Not very well. He is teething.

Fourth F. V.—Have you tried that medicine I gave you?

First F. V.—Not yet.

Fifth F. V. (still another listener)—Say, Florence says she is going to have old Ben's tail docked. (Universal giggle-ment. This is evidently a neighborhood joke, intelligible only to the initiated.)

Third F. V.—Say, next Sunday's quarterly meeting. Who is going to have the elder for dinner? (I do not think she meant that there were cannibals in the neighborhood.)

Fourth F. V.—He has promised to come to our house.

And so the conversation ran on for ten or fifteen minutes, and I predict that the opportunity for just such neighborhood visiting by telephone will do more to break up the retiring habit among farmers than any other agency now at work.

The Bell Telephone Company, the New England Telephone Company and the National Bell Telephone Company, on their own petition, were dissolved as Massachusetts corporations in Boston on December 8 by Judge Hammond of the Supreme court. The ground of the petition was that they are not now engaged in business, having been superseded by a corporation or corporations organized under the laws of another state.

Efficiency of Modern Telephone Equipment

A Paper Read by M. A. EDSON Before the Chicago Electrical Association, December 4, 1903.

Transmission of speech has for the past twenty years occupied the time and inventive genius of a large number of engineers and has also required an enormous financial expenditure. Engineering problems have been met not alone in actual construction, but in some purely experimental exchanges involving every actual condition to be met in operating and maintenance. And yet there are instances where exchanges have been planned with every feature carefully worked out that have been radically changed at large expense before being put in operation, on account of some engineering or operative improvement. After viewing all of these changes and evolutions, can it be said that the actual efficiency of the plant, for purely conversational purposes, after the desired connection has been made, is any higher to-day than it was twenty years ago? Ignoring any statement to the contrary, local transmission is only a little better, while long distance transmission as a whole is greatly improved.

Increase in efficiency of long distance telephonic transmission systems may be attributed to fifty per cent in the line and twenty per cent in the transmitter. Conversation may be carried on over these improved lines with a Blake transmitter with fair results, but it lacks power and clearness, due to several faulty elements in the mechanism for transforming the energy of the sound waves into electrical undulations. This mechanism has required more attention in proportion to the results obtained than any other part of the system. We have to-day the all-carbon transmitter, with the low-wound induction coil, which transforms the sound energy into electrical undulations which are better for transmission, because they conform to the sound waves and avoid the sharp peaks due to the self-induction kick of a high wound secondary and the undamped inertia of the transmitter parts.

Inefficiency in the modern transmitter is due to two elements—namely, loss in mechanical transformation of sound energy caused by mechanical pressure, or agitation of the carbon and loss due to maintaining a supply of electrical energy. This energy varies between rather narrow limits; one-tenth to fifteen-hundredths ampere as an average for common battery and one-tenth to four-tenths for local battery. The exact mesurement of sound energy at a point six inches from the mouthpiece of the instrument has been tried, but the results are not uniform and most of the methods are open to serious error introduced by the direct action of the air pressure on the instrument. The use of vibrating strings has proved the most satisfactory, but are open to the objection that two very heavy piers are required to prevent mechanical conduction vibrations from reaching the measuring diaphragms. Experiments have been made by using piano strings on separate mountings, electrically maintained by fine platinum wires at a nodal point, dipping the wires into mercury at the vibrating point between the poles of a powerful permanent magnet. A similar arrangement was used by Dr. Pupin several years ago in demonstrating resonance phenomena. All measurements made by the use of single musical notes or simple combinations are objectionable, when the quality of the transmission is considered, but are justified as a means of obtaining exact engineering data as a base for energy calculations and transmission lines. A frequency of 125 to 750 cycles per second should be used. The most common constant is 750, but when the frequency is raised to 1,200 phenomena are developed in the iron. If this occurred at a lower frequency it would seriously interfere with the transmission efficiency, but fortunately there are only a few singers who can reach a note as high as 1,100, and experiments made at these frequencies of 750 to 1,200 cycles are more interesting than useful.

Transmitters having a low fundamental note seems to be the tendency of late years, because such transmitters will give greater volume and rate of variation of the primary current per unit of sound energy. Lower fundamentals lessen the tendency of the transmitter and amplify certain tones which are nearest to the diaphragm. The efficiency of the subscriber's station equipment from an engineering point of view presents more difficulty than the central office if exact measurements are to be made, but from recent tests the transmitter changes sound energy into electrical undulations at an efficiency of fifty per cent in common battery plants and seventy-five per cent in local battery plants. In common battery the efficiency is still further reduced if the loss in the line is considered, and it should be considered, because it is a part of the primary circuit. These figures are only for the transmitter and do not include the induction coil or other inductive devices.

Another uncertain element in the efficiency of the common battery transmitter is its distance from the exchange. It is evident that the greater the distance from the exchange means less current, as it is not the modern practice to vary the battery or resistance for different lengths of line, and the consequence is that an instrument in the exchange building receives three-tenths ampere through the transmitter, and another through four miles of cable receives one-hundredth ampere, which is about as far as it is safe to go without repeating coils and trunk lines. The average limit is usually set at 350 ohms per line for twenty-four and forty volt systems. The line efficiency for common battery systems at two miles from the exchange is eighty per cent and may go as high as ninety per cent, but for local battery it is still higher, because the line is used only for the high voltage variable telephone current. The average value is ninety-five per cent for copper metallic aerial circuits and eighty-five per cent for standard underground cable. It is evident that the line loss at twenty-four volts is greater, distance considered, using uniform size of line wire. By reducing the distance and increasing the size of the wire this loss can be perceptibly diminished.

With a soft iron cored pair of electro magnets very little improvement in the principle of a permanent magnet and diaphragm in the receiver has been made. The improvement that may be made in the future will not materially affect the present efficiency, which is about eighty-five per cent. Receivers, like transmitters, should be made for frequencies of about 750. The most efficient instrument should have a range of 250 to 2,000. The acoustic properties of the receiver may be improved in several ways, principally in the shape of the cavities around the diaphragm, and in reducing weight. Improvements in switch-hook mechanism has had the greatest tendency to make this feasible.

The efficiency of the exchange proper can be considered as a means for connecting the subscribers together in pairs. Upon this efficiency depends the speed with which connections are made and the cost and accuracy of operation.

The engineering elements that enter into the construction of a modern telephone exchange may be divided into three classes—the power plant, the switching mechanism and the distributing and testing boards, comprising the various toll, trouble and supervising desks. From power plant test runs

on five common battery exchanges of 1,000 to 5,000 equipment more than fifty per cent of efficiency has been shown from the supply mains to the various switchboard distributing points. This, according to published reports in TELEPHONY, is calculated as follows:

Efficiency of motor-generator combination.....67.5
Efficiency of charging mains.....94.3
Efficiency of motor-generator and battery leads.....63.5
Efficiency of batteries.....72
Percentage of total energy delivered to switchboards...52

The ringing dynamotors have a twenty-four-hour efficiency of forty per cent in the ordinary way they are operated, with lamps in the ringing circuits.

Distributing boards for exchanges of from 1,000 to 10,000 lines offer very little choice for improvement. Protective devices and the carbon block lightning arrester might require changes in minor details, and some new form of heat coil or strong current protection might be devised.

In estimating the efficiency of protection devices a good plan is to take 100 heat coils and test ten of them under ten different conditions, such as protecting a high resistance enclosed coil under high voltage and low current such as 500 volts and a 1,000-ohm coil with line resistance to bring the current down to twenty-five hundredths ampere, and the others on various lines up to 300 volts with a seven-ohm heat coil protecting a 100-ohm enclosed spool and no line resistance. A result obtained in a recent test was that ninety-eight per cent of the spools were properly protected and two per cent injured by charing, but these imperfect ones would not have caused a fire. The general efficiency of protection and distributing boards is ninety-five per cent. Toll desks or switchboards are generally equipped with apparatus affording clear transmission. In the average modern toll board the efficiency is about the same as the system under which the main exchange is installed, except in the case of the automatic system, and then it becomes a separate element and its efficiency may be low in comparison. Trouble desks are of a special design and are not subjected to the same demands as other exchange equipment. It might be treated as a branch exchange in so far as it concerns the subscribers' connections.

Supervisory desks are also treated as a separate element, but their efficiency should be considered with the switching element proper, for their work, being corrective in conception as well as in fact, increases the general efficiency of the system.

In considering the efficiency of the switching element proper we may go back to the subscriber's station and lay down the requirements for a connection.

(1) The greatest requirement is good transmission. By this is not meant great loudness, but strong, clear conversation, entirely free from annoyances from clicks, cross-talk, inductive disturbances and other people or operators cutting in on the line; in other words, *the equipment must talk and nothing else.*

(2) Speed in making connections must be attained without sacrifice of accuracy and the only delay should rest with the called subscriber. This speed should compare with the time required to open a conversation with a person coming to your desk. It should be as if you could reach out and shake hands with any one of 10,000 persons.

(3) After the telephone's business is finished no time of the subscriber calling or called should be taken up with manipulating the equipment. It should be absolutely self-restoring.

Under the first requirement the efficiency will be, we will assume, 100 per cent between two subscribers with no exchange and local battery. To compare this with a 5,000-line exchange on the central energy manual switchboard and starting at the terminals of the battery the first piece of apparatus to be encountered is the retardation coils. Since these coils are a necessary part of all large common battery systems, it only remains to determine the most efficient arrangement. In the first arrangement the coils are both retardation, resistance limiting battery to transmitters and repeating coils, and in the same circuit is included disconnect relays as a separate element. In the second, the retardation, resistance and disconnect relay is one with the addition of condensers between the coils in the well-known way. The efficiency of the first combination is forty per cent. The second combination is 50 per cent, as it is less influenced by leakage and contains the signaling element in one combination. The use of condensers is also an advantage in reducing the inductive losses in the coils. In the exchange with local battery only a high impedence and high resistance bridge is across the circuit and the transmission efficiency is ninety-five per cent after all connections are made. And this refers only to speech transmission in the best switchboard construction for local battery. Electro mechanical signal call and disconnect magnet signaling systems are not being considered because they are obsolete for large exchanges. In the first combination the repeating coil system is inefficient for the reason that it is very susceptible to unbalanced conditions of lines and leakages. Difficulty is also encountered in constructing coils which will have a high efficiency and still be susceptible to such varying loads as three-tenths ampere and one one-hundredth ampere. The loss due to the auxiliary relays, lamps and similar devices must also be overcome. In large exchanges it is generally conceded that the best types of modern central energy manual switchboards require the same number of operations. These operations are summed up here as follows:

1. Subscriber takes receiver off hook.
2. Subscriber's individual signal lights up above pilot lamp, involving a double operation, for the relay must make the first contact and the locating of the lamp filament the second.
3. Operator inserts answering plug. This also involves three movements from a military point of view: pick up plug, locate jack, insert plug.
4. Operator sets listening key.
5. Operator asks number.
6. Subscriber gives number.
7. Operator repeats number.

(At this point two routes are to be considered: A—local, or same office; B—trunk to a separate exchange.)

"A" ROUTE.

8. Operator picks up plug, locates jack in multiple.
9. Operator test for busy.
10. Operator inserts plug.
11. Operator rings called subscriber.
12. Operator restores listening key.
13. Operator notes when called subscriber's lamp goes out in cord circuit.
14. Called subscriber answers.
15. Called subscriber hangs up receiver.
16. Connecting cord lamp lights.
17. Calling subscriber hangs up receiver.
18. Answering cord lamp lights.
19. Operator removes answering plug.
20. Operator removes calling plug.

"B" ROUTE TRUNK TO SEPARATE EXCHANGE.

8. Operator selects order wire key.
9. Operator gives order to incoming trunk operator.
10. Incoming trunk operator repeats number.
11. Incoming trunk operator gives trunk number.
12. First operator picks up plug, locates trunk jack and inserts plug.
13. Incoming trunk operator tests line of called subscriber for busy.
14. Incoming trunk operator inserts incoming trunk plug in called subscriber's jack.
15. Incoming trunk operator sets automatic ringing key.
16. Automatic key rings subscriber.
17. Called subscriber takes up receiver and restores key automatically.
18. Calling subscriber hangs up receiver.
19. Supervisory lamp at first operator's position lights up.
20. Called subscriber hangs up receiver.
21. Second supervisory lamp lights up.
22. First operator pulls out plugs.
23. Disconnect lamp on incoming trunk cord lights up.
24. Incoming trunk operator pulls out trunk plug.

In all manual boards there is very little variation in this

cycle of operations. Visual mechanical signals are used instead of relays and lamps and different methods of trunk operation are devised without materially increasing the efficiency. The efficiency of operators as a part of the system is one of the most valuable quantities with which we have to deal in the manual systems. An operator may work eight hours at an efficiency of eighty per cent. This is based on the principle that the operator has 100 per cent of work to perform, and eighty per cent of the work is done correctly and twenty per cent is unnecessary errors and delay. This seems reasonable, when we consider that twenty per cent of the calls in a manual central energy office are lost at the switchboard. In some recent tests with modern equipment a variation in the work of each operator for the same period of eight hours showed 200 calls per hour and eighteen seconds per connection for one, and 100 calls per hour and thirty-six seconds per connection for another. It is obvious that at night the calls are so low per operator that the efficiency is 100 per cent, and yet such a statement must be made with the understanding that a rush of calls for some unknown reason may reduce the efficiency of the operator to five per cent, by which is meant that the operator is able to answer and complete only five per cent of the calls sent in.

Disconnection of all apparatus is performed in a manner to leave little to be desired. Magneto signaling has been eliminated and hanging the receiver on the hook gives the only signal at the exchange that is required.

The low cost for consumed power is based on the fact that current is used only when the signals are operated and no cut-off relays are used. In the most efficient common battery combination the retardation coil relay condenser system with visual electro-mechanical signals consumes less than sixty per cent of energy in the all-day operation of the equipment. The common battery repeating coil relay system with lamp signals throughout is worked at an average efficiency of fifty per cent.

All these efficiencies refer only to the switching equipment and do not include lines, power plant or subscriber's equipment.

The operation of an automatic equipment is very efficient, as such a system is free from the interference of operators, busy test clicks, cross-talk, and is also reasonably free from inductive disturbances. The line is bridged by high impedence, high resistance coils and has about the same efficiency as the local battery board with one clearing out drop, but the complexity of the plant must be considered.

The operation of making a connection with automatic system is reduced from twenty and twenty-four per cent to from five to eight per cent in calling a number from 1 to 9999. This is calculated thus:

1. Subscriber removes receiver from hook.
2. Rotates dial for thousands.
3. Rotates dial for hundreds.
4. Rotates dial for tens.
5. Rotates dial for units.
6. Push ringing button.
7. Called subscriber answers.
8. Hanging up either receiver clears the line.

The power requirement is a little less than the common battery, and the efficiency of the power plant is the same. Maintenance (mechanical) is less than common battery, and the life of the plant is greater, for it can be built on heavy lines from an engineering standpoint, requiring no special refinements in the way of woodwork and finish.

Efficiency of exchange equipments is affected in so many ways that it is most difficult to compare one plant with another. The local conditions under which one plant operates may be such that another could not do the work with half the efficiency due to the methods of operating which are necessary to the public service. The all-day efficiency is variable and is modified by the class of service given, whether measured service or flat rate.

TABLE OF TELEPHONE PLANT EFFICIENCIES.

	Per cent. Manual System.	Per cent. Automatic System.
Lines—local battery	95	95
Lines—central energy	90	..
Switching mechanism—local battery	90	90
Switching mechanism—central energy	50	..
Subscribers' equipment—local battery	25	25
Subscribers' equipment—central energy	15	..
Operators or operating	30	90
Power plant	50	50

Net plant efficiency—local battery, 3.2 per cent.
Net plant efficiency—central energy, .9 per cent.
Net plant efficiency—automatic local battery, 9.6 per cent.

The power plant efficiency will increase slightly with the size of the exchange, but it is assumed to just supply the ultimate equipment of the plant.

In the local battery systems the power plant decreases in size at the central office, but the number of local batteries increases in direct ratio to the number of subscribers. The efficiency for good service is 50 per cent of the available energy in the local battery.

The central energy subscribers' equipment shows a low efficiency on account of the inability of the transmitter, local induction coil and condenser to transform the comparatively low tension primary direct current into high tension alternating or undulating current.

In calculating the efficiency of the various auxiliary devices, such as induction coils, repeating coils, relays and retardation coils, the losses have been measured on the same basis as modern power transmission transformers—viz., iron loss, copper loss and the ratio of transformation for various frequencies within the range of the human voice. A point remains for future work to ascertain the effect of wave form on the apparatus, but investigation is now under way with special telephonic osciligraphs and valuable engineering data is being collected.

The telephone industry has passed through three periods of evolution. The apparatus used in the eighties—magnet, series and Blake transmitters; the period of the nineties—bridging, multiple, all carbon transmitters, metallic lines, etc.; the period of 1900—central energy, automatic signals and still better lines. Are we not now entering on a fourth period of automatic central energy telephony, with high hopes of increasing the all too small efficiency of modern telephone equipment?

NEW INDEPENDENT EXCHANGE FOR EVANSTON.

An Independent exchange is to be installed in Evanston, Ill. The following statement is taken from the Evanston Index:

Mr. James E. Keelyn has applied for an ordinance in the name of "Citizens' Telephone and Telegraph Company," which will be the name of this company.

The incorporation of the new company has been prepared and will be filed within a few days. The incorporators are James E. Keelyn, W. T. Mason, Schuyler J. Stratton, Charles A. Wightman, B. B. Noyes, W. J. O'Connell and Thomas E. Connor.

There will be a president, vice-president, secretary, treasurer and general manager, an executive board of five directors and an advisory board of thirty members selected by the stockholders. These will be nominated at the first stockholders' meeting, and their names will not be made public until that time.

At this writing there are 291 subscriptions for stock to the new company, varying from $200 to $50 each. The maximum allowed is $200 to any one telephone, and the minimum $25. Nearly every subscription is for the maximum amount. It is known that wealthy Evanston residents are ready to take every share of stock not subscribed for by the telephone users themselves. The Avenue House will have the new Keelyn telephones in every room and like arrangements have been made with several prominent apartment houses, which will have the Keelyn telephone in every flat. One large house owner has contracted for twenty-four Keelyn telephones to be placed in each of the houses owned by him and sublet to his tenants. Several owners of fine residences have arranged to equip their homes with the new telephones from attic to basement and stable.

The new company has been assured the Chicago connections and are guaranteeing it to their patrons.

Mr. Keelyn expressed confidence in the full success of his enterprise. The Inter-State Telephone Association at its meetings in Chicago indorsed Mr. Keelyn's new company as the only Evanston one having membership in the association.

THE TRANSMISSION OF INTELLIGENCE.

CHRISTOPHER WEBSTER.

A newspaper prophet recently made prognostication that within a year we should have the long-distance telephone as another link connecting London and New York. This dream may and may not be realized, but within three months we are to have direct telegraphic communication without intermediate repeating stations, telegrams arriving at four times the speed of previous cable messages. Another step in the great development of means of rapid long-distance communication.

Sixty years ago, and there were no means at all. During the last six decades were invented and perfected the four great wonders in this line—the land telegraph, ocean telegraph, telephone, and last the wireless method of swift dispatch of messages. Sixty fruitful years, sixty revolutionary years.

Englishmen assert that prior to Morse's telegraph, two of their own countrymen had invented a practicable telegraphic apparatus, the Cooke-Wheatstone telegraph. For years Mr. Cooke, a Scotchman, worked away on his invention, encouraged by Faraday, the famous English physicist and chemist, to go on with his experimenting; Faraday telling him "it would be a beautiful thing to carry on in this manner a conversation from distant points." Mr. Cooke, after toiling alone for years, became associated with Prof. Wheatstone, a noted man of science, and together they labored at an invention that was patented in June, 1837, the first galvanic electric patent in any country.

This telegraph was first made use of only for railway service, but soon messages began to be sent for the public, and the use of the telegraph spread rapidly in the United Kingdom. Dr. Hamel, of St. Petersburg, writing in 1859, says that to Cooke and Wheatstone is due the honor of having given the example in applying the electric telegraph to practical use for society at large; not only in Great Britain, but throughout the world. A writer in an English periodical thus comments on the way in which the world received the news of the invention: "Of course there were many claimants for priority of invention as soon as Cooke and Wheatstone's telegraph was announced as being at work, and, of course, America was to the fore in the scramble."

The first actual patent obtained by Morse was not until 1840, but years prior, in 1832, he had experimented with electro-magnetic telegraph recording; and though his patent was granted after the Englishmen's certainly his contributions to the science of telegraphy are of unquestioned greatness, such that the whole world yields him homage. Morse was a painter by profession; and the boy that at college was more interested in the study of art than the study of electricity became the founder of the American system of the electro-magnetic telegraph. In 1832, while returning to America from France, he became especially interested in the subject of electricity, and on the voyage devised the dot and dash alphabet. After he reached home, in a "combined studio, workshop, bed-chamber and kitchen," he labored at his models, and made his apparatus after his appointment to a professorship in the University of New York. He exhibited his working model in 1835, and the same year discovered the relay, which enabled him to reenforce the current after it had become feeble. In 1838 Morse went to Europe for the purpose of interesting foreign governments, but was not successful and returned to this country. Then followed four years of almost abject poverty, but in 1842 congress voted him $30,000 to aid in carrying out his theories; and the work of the American telepraph was launched. On the 24th of May, 1844, a public exhibition was given, and the marvelous message flashed from Washington to Baltimore.

A few figures in regard to the growth of the telegraph may be of interest: In 1866 there were in this country 2,250 telegraph offices, operating 75,686 miles of wire; in 1867 the average cost of sending a message was one dollar; ten years later the price had fallen one-half. In 1897 there were 21,769 offices, and for that year the number of messages sent was 58,151,684, the average cost to the sender being less than 31 cents.

Oceanic telegraphy, as the student of the science well knows, has been brought to its present degree of excellence by the labor of many hands, the thought of many men; but the name of one man stands out very prominently, that of Cyrus W. Field. The promoting of the first cable telegraph was marked by long years of struggle and defeat. For thirteen years Mr. Field devoted his whole time to the project, in that period visiting Europe three times every year, making acquaintance with government officials, capitalists and engineers of note, whom he endeavored to interest in the scheme for binding together the two continents. In 1858 the cable was laid, but became suddenly useless after a few days' trial. The civil war interfered for years with further progress, but in 1866 the Great Eastern safely deposited a larger cable on the bed of the ocean, and the Atlantic cable became an unbounded success. The Commercial Year Book of 1899 gives the length of the world's cables of that year as 161,384 nautical miles; but with the recent development of cable building in the Pacific these figures can now be very considerably increased.

We have had the telephone with us only twenty-five years. It is a little difficult to say just exactly with whom the honor of the invention of the telephone should lie, as Prof. Alexander Graham Bell and Prof. Elisha Gray on the same day filed applications for patents for the invention of a telephone. And in addition to these men of science, there was another claimant, an obscure inventive genius, who averred that in his own unknown workshop he had himself evolved a successful telephone. To-day the name of Prof. Bell is the one most prominently associated with the invention.

It was in 1875 the invention of Prof. Bell was made known to the world, and two years later that the first telephone exchange was established in the United States. The system has increased rapidly; now conversation can be held between points more than 1,000 miles apart; the number of exchange and toll line connections in this country now reaches almost 2,000,000,000 yearly; the total number of stations in the United States in 1902 was 1,020,640; the entire capital invested in telephone systems here was estimated at $350,000,000. We hold a leading place among the nations not only in the development of the system, but also in the use of improved appliances. As respects development of telephone service, the countries may be ranged after the United States in the following order: The German empire, Great Britain, Sweden, France, Switzerland, Austria, Russia, Norway.

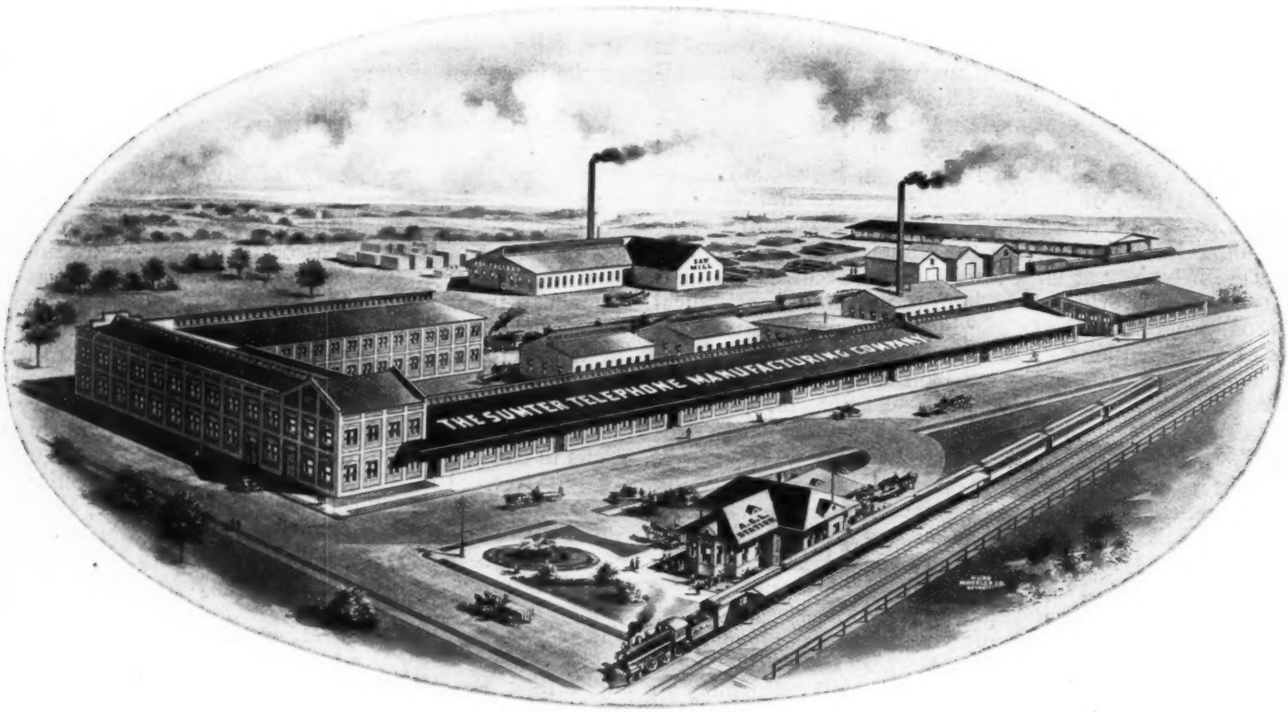
In 1895 Mr. Marconi began experimenting with wireless telegraphy, manipulating his simple apparatus on his father's estate in Italy. The young inventor found strong supporters from the start, and now, eight years after its invention, the wireless telegraph is in use far and wide. There are at present thirty-five or more Marconi stations in different parts of the world, or, including those on ships, about seventy stations. The Italian government has used the Marconi system largely on its warships, and companies in Great Britain, Canada and the United States have been organized for exploiting and controlling the system.

The first message sent by the land telegraph was: "What God hath wrought." That first great invention seemed, of a truth, no less than a miracle; and, when we take a moment to think of it, we ourselves still look upon as wonderful these everyday conveniences about us—the telegraph, telephone, ocean cable and winged wireless message bearer.

I am interested in TELEPHONY. You get out a fine monthly. C. E. SACKETT, Garden Prairie, Ill.

THE SUMTER WORKS.

The accompanying view of the Sumter Telephone Manufacturing Company, Sumter, S. C., will no doubt prove interesting to the many customers of this corporation. The large two-story section has been added during the past year, providing considerable more floor space, and in which section of the plant the stock rooms and assembling departments are located, thus allowing additional floor space for machinery and manufacturing departments, where new machinery is now being installed and the output greatly increased, which is made necessary to meet the demand for the company's product, as it is now far behind in filling orders, the business of the company being much larger this season than ever.



WORKS OF THE SUMTER TELEPHONE MANUFACTURING COMPANY.

It is a well-known fact that the Sumter Telephone Manufacturing Company is one of the very few manufacturers of telephone apparatus who make the entire equipment in its own plant. It is stated its cabinet work is particularly handsome and made from lumber sawed from the log upon the company's sawmill operated as a part of its plant, and as is clearly shown by the accompanying cut, this company has every convenience for the handling of raw material, as well as the most modern facilities for manufacturing the great number of parts entering into the construction of telephone sets, switchboards and kindred appliances. The high character of work produced is recognized by a large percentage of the telephone users throughout this country, Canada and Mexico, and the United States government is using quite a number of special telephones made by the Sumter company for the army service.

The gentlemen at the head of this institution should feel gratified in the rapid development of this company, which is numbered among the most prominent manufacturers of telephone equipment.

The president, Mr. C. T. Mason, is also the company's chief engineer. Mr. Mason is well known as a man of unusual ability, and the splendid reputation enjoyed by this firm for efficient and high-grade instruments is but a mark of Mr. Mason's ingenuity.

The sales department of the business is under the personal supervision of the company's vice-president and secretary, Mr. F. C. Manning, who has a large acquaintance and many friends among the exchanges and electrical trade throughout the country. Mr. Manning is ably assisted by Mr. C. G. Rowland, who is also the treasurer of the company and a man of strong character and business judgment.

Some idea of the demand for the product of this company may be better realized when it is known that it has not had to employ the services of a regular salesman within the past two years, the orders being constantly in excess of the output; but with the improved facilities and large addition recently completed it anticipates being in position to handle its business promptly during the next year.

Naturally the citizens of Sumter take great interest in this establishment, which they have seen grow to such magnitude in so few years, and wherein employment is given to a large number of its citizens. The great number of cotton

factories in South Carolina have made the state famous for the production of cotton goods, but none of the industries have been more prosperous or deserve more credit than the Sumter Telephone Manufacturing Company, and this institution is a striking example of the progressive spirit of the South and a great advertisement for the old Palmetto state.

KANSAS CITY PLANT.

The recent consolidation of the Kansas City Telephone Manufacturing Co. and the B-R Electric Co., of Kansas City, under the name of the B-R Electric and Telephone Manufacturing Co., provides exceptional facilities for supplying the requirements of the Western trade. The telephone factory is turning out apparatus claimed to be equal to the best and the telephone supply department is also claimed to be as complete as that of any house in the country. The building now occupied at the corner of Fifth and Delaware streets is 70x150, four floors, providing an acre of floor space, all devoted to the electrical trade. This building was remodeled especially to fill the requirements of this company and every modern convenience and facility is provided for the rapid execution of the work in hand. The offices are commodious, carefully arranged and provided with the most modern office equipment. The company makes a specialty of electric light supplies as well as the manufacture of telephone apparatus, line supplies, etc. Each department, however, is under its separate and distinct management which affords the most careful and prompt attention to the requirements of the electrical trade in all branches. The new telephone catalog just issued is one of the most complete and attractive ever presented to the trade, showing the company's line of goods in a most comprehensive manner. It not only shows a complete line of apparatus and supplies, but contains much valuable information relating to the construction of telephone lines, and exchanges, as well as being a complete description and price list of apparatus and supplies. Some idea of the volume of business done by this company can be conveyed when it is known that the sale of telephone wire alone in 1903 will exceed two million pounds and the sale in telephone apparatus and other line supplies are in proportion. The company is heavily capitalized. There is no cause for delay in shipment. It is a great pleasure to any one interested in electrical lines to visit this establishment while in Kansas City. The officers of the company are F. M. Bernardin, president; E. L. Foutch, vice-president; E. R. Royer, treasurer, and J. M. Stephen, secretary.

A NEW SUBMARINE PLANT.

The John A. Roebling's Sons Company has just completed a new building, which will enable it to largely increase its product of insulated wires and cables of all kinds and will provide room for introducing on an adequate scale the manufacture of submarine cables. The company has made submarine cables for many years, but this part of their business seems to demand greater facilities, and to provide for this one of the largest and most complete plants in this country will be installed. The new buildings are located so that shipments may be made either by water or rail, and the company will soon be in a position to solicit the largest contracts in this line. Both rubber and gutta percha core is used, and the present large rubber plant will take care of those orders calling for rubber insulated cables. Formerly the company imported gutta percha core, but it is its intention in the new plant to provide a complete factory for manufacturing this core under the direction of a most competent and experienced manager, one who has had a long and successful experience abroad in this kind of work. It is the intention to so equip the new factory that submarine cables of any kind of core, with any description of armor, may not only be made, but to provide the necessary apparatus and equipment to lay any of the cables manufactured. The Roebling company will be in a unique position among American manufacturers, not only in the variety of insulations it can furnish, but also from the fact that it will be prepared to take contracts to turn over to the purchaser the submarine cable laid and ready for use. It will also have the advantage of manufacturing all the constituent parts of a cable—viz.: copper wire, insulated core and armor wire. This should not only reduce the cost, but it should insure to the purchaser the very best material, all manufactured under one supervision, and for which one company will be responsible. The Roebling company has a reputation for taking large contracts, and its responsibility is so well and favorably known that there is no reasonable doubt but that the new factory will soon be engaged on large government contracts for this class of material.

In 1894, when there were only nine telephone companies in Ohio, and they were allowed to return their own property for taxation, the revenue to the state was ridiculously low. The same was true of express companies.

As a consequence their appraisement was given to a board of state officials.

This year the valuation of the telephone companies which the state board is now placing, will be between $10,000,000 and $11,000,000 alone.

The number of companies has grown from 9 to 284.

The work of the board is arduous, the smaller companies requiring nearly as much attention as the larger ones.

An Important Independent Victory

The North Electric Company defeats Western Electric Company on Spring Jack Suit.

There was handed down by Judge Francis J. Wing in the United States circuit court, northern district of Ohio, on December 21, an opinion reading as follows:

"In this cause the bill is dismissed and judgment for costs is awarded against complainant."

This was in the suit in equity of the Western Electric Company vs. the North Electric Company on patents Nos. 357,538, Scribner; 488,033, Scribner and Warner, and 552,729, Scribner, and was a most sweeping decision against the Western Electric Company on the use of spring-jacks using long and short springs.

This is the second decided victory won against the Western Electric Company (Barton and Tanner, attorneys) by Albert Lynn Lawrence of Cleveland, attorney for the North Electric Company. The other decision was in the Warner tubular drop, rendered in May, 1903, and fully described in TELEPHONY in the June issue.

An adverse decision in the suit would have meant the necessity of going back to primitive days in switchboard construction, making the use of round plugs impossible and compelling the reconstruction of all switchboards in Independent exchanges so as to use flat or square plugs to get away from the long and short spring in the jack.

It rarely happens that an adverse decision to complainant is handed down, giving him no reasons whatever in the opinion for practically throwing him out of court, and on three different patents at that.

The decision means that the use of long and short springs is open to the Independents for all time and a threatening peril has been averted.

The story of the case and patents involved is as follows:

Some two years ago the Western Electric Company entered suit against the North Electric Company at Cleveland upon the following patents, covering the construction of spring-jack switches: 357,538, Chas. E. Scribner, February 8, 1887; 488,033, Scribner and Warner, December 13, 1892; and 552,729, Chas. E, Scribner, January 17, 1896. The second patent, that to Scribner and Warner, is one which has long been considered to be one of controlling importance in the telephone field, and the well-known features of the type of spring-jack manufactured by the North company were confidently asserted by the Western Electric Company to be plainly an infringement on the sweeping claims of this patent. These claims have frequently been sought to be evaded or avoided by manufacturers of telephone apparatus, but, relating as they do to the employment of long and short springs for controlling the two limbs of a telephone circuit, the evasions, to say the least, have been doubtful.

The other patents relate more particularly to features of construction of the strip of jacks. The first, the "early Scribner patent," discloses a spring-jack switch fully assembled and insertible in and removable as a unit from the comb-like strip or frame of rubber, which is bored and slotted to receive within its body a number of such jacks. The parts of this jack, corresponding exactly to similar parts of still earlier spring-jacks, are punched from sheet metal, assembled in parallel planes and secured together with rubber insulators by means of a transverse screw and pin to form a complete jack, which is fastened at its rear by "a single screw" passing through a laterally extending ear or lug into the edge of the rubber frame or strip.

By reason of this arrangement the patent states: "On removing the screw of any jack it is evident that the jack may be removed, and all parts of its parts thus made accessible for adjustment or repairs."

Obviously the thin metal punchings described are lacking in the strength necessary to withstand ordinary service, but the patent further says: "Being, however, *connected together* and supported by the rubber frame, as before described, they will be sufficiently rigid to be durable and effective for the purposes for which they were designed."

Four claims, 1, 2, 3 and 5, were declared upon; the first, second and last relating to these individual jacks in combination with the slotted rubber mounting frame or comb-like support formed to contain said jacks, and the third claiming the completely assembled jack, but separate and apart from the frame.

The principal reference relied upon by the defendants was the well-known type of spring-jack shown in the expired patent to Richard V. Freeman, No. 309,218, dated December 16, 1884, under which suit was brought some years ago by the Bell interests at Detroit. A number of other references were offered in evidence relating to certain features of the Scribner construction.

In the Scribner and Warner patent another type of spring-jack is shown, designed for specialized use in a single portion or section of a multiple switchboard. It has two springs of different lengths, adapted to engage separate corresponding contact parts upon a switching plug, provided for insertion in the jack. The two springs have normal inner contacts, from which they are separated by inserting the plug.

In this patent in suit a tubular test piece is permanently connected with the longer of the two line springs in the jack, as stated in the patent: "In order to make the contact between the sleeve of the loop-plug and one of the springs more certain and to adapt the plug for use in multiple-switchboards systems," while the end or tip contact of the plug is of smaller diameter than the sleeve, as in prior patents, in order that the longer spring "may be so adjusted as not to form contact with said tip"; although no advantage or function is mentioned as being attained thereby.

The first and third claims were relied upon by complainant—the first setting forth not in a spring-jack switch, but very broadly in "a circuit changing device," an admittedly old combination of elements, as is shown by the file wrapper, including two springs, their normal contact pieces and the tube or guide, in combination with this old two-contact plug, having its tip smaller than the sleeve—a feature previously adopted to prevent its making contact with and closing circuit through the frame of the early individual jacks.

In the third claim is set forth the combination with two springs, here specified as being of different lengths, of the "guide in front of said springs," and a plug having two terminals, one upon the tip, whose size is not specified, and the other upon the sleeve. Both claims are somewhat amplified by the recital of functions accomplished by the elements thereof, but without in any way confining the alleged invention to spring-jacks or any other specific form of circuit-changing device.

Two patents of Chas. E. Scribner, 383,013 and 427,123, were employed to show the strong probability that no joint inventorship actually existed with respect to the features broadly claimed in this patent in suit, while that of Thayer and Kugler, No. 377,788, of February 14, 1888, clearly discloses the use of long and short springs in an earlier spring-jack switch.

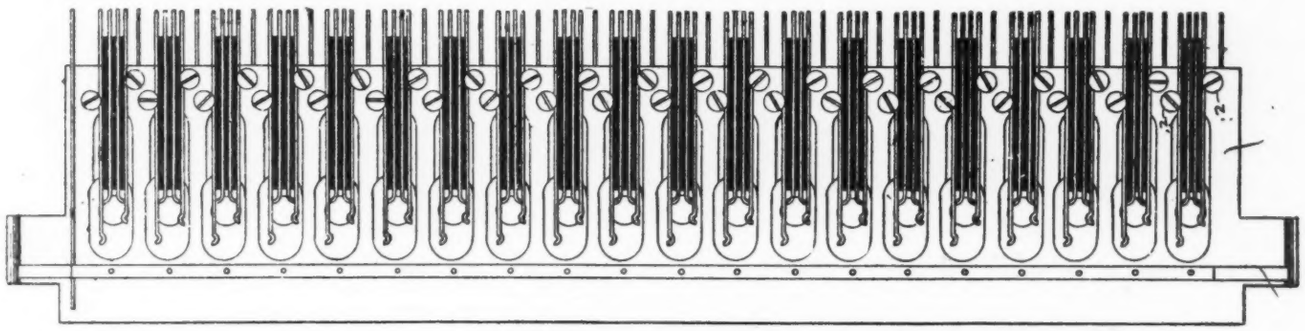
The last patent in suit, Scribner, 552,729, also describes a

specialized form of spring-jack adapted for use in a single portion of the multiple switchboard, and was designed in part to accomplish much the same purpose as was the device of the last patent in suit considered.

The patentee says that he has provided a spring-jack "whose switch contacts shall be accessible for testing to determine the insulation and continuity of the circuit wires."

This he accomplishes by the use of a rubber mounting plate of distinctive character, recessed to contain the inserted spring-jacks; each of the receiving grooves provided therein being forwardly expanded or enlarged to afford ample space for the extremities of the four springs of the inserted jack.

Rubber insulating tongues or washers, as in the early

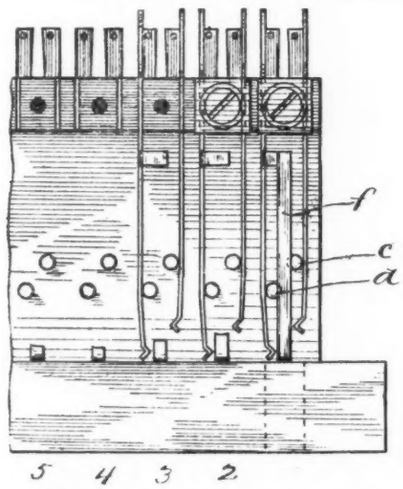


552,729—C. E. SCRIBNER.

Scribner patent, electrically separate the several springs; all of said parts being laterally bored to receive two insulating pins for securing the jack parts together prior to individually mounting the jacks in the grooved plate, by means of two side-screws inserted rearwardly in the rubber frame and bearing upon the rear of the said jack parts.

The patent further states that each jack "essentially comprises," among other parts, two short thimbles d and e, forming "the usual 'local' contact pieces, which are connected with the annunciator for the purpose of restoring it and for testing purposes."

Claims 2 and 4, declared upon, relate to the grooved strip or plate of insulating material, with jacks comprising, re-



488,033—SCRIBNER & WARNER.

spectively, the line springs and the line and inner contact springs, separated by interposed tongues of insulation, inserted on edge in the recesses or grooves; both of said claims omitting, however, all reference to either of the two thimbles, one being necessary in a jack for multiple switchboards for testing purposes.

Claim 8 specifies simply a partial spring-jack, comprising the duplicated line and contact springs, together with their interposed rubber tongues, and the connecting transverse insulating pin extending through each of the parts.

Against this patent, among others, was cited the one to Scribner and Patterson, No. 489,571, showing substantially the frame or strip for mounting springs flatwise therein, while patent No. 458,258, granted August 25, 1901, to the well-known French inventor, L. A. Bethon, sets forth a strip of spring-jack switches having characteristics very closely approaching those set forth in the claims declared upon.

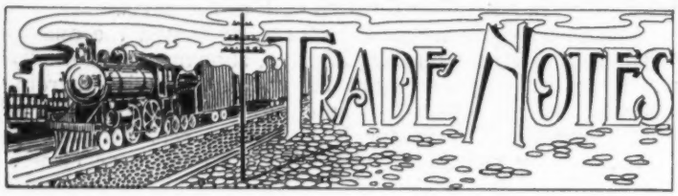
At the hearing of this suit at Cleveland in November last the complainant found it expedient to dismiss as to claims 1 and 2 of the early Scribner patent, and claim 8 of the last patent in suit. Judge Francis J. Wing, having had the case under advisement since then, filed an opinion December 21, dismissing the bill of complaint at the cost of the Western Electric Company, thus scoring a signal victory for the North Electric Company and for the Independent interests upon three separate patents previously considered of prime importance.

RUN BY TELEPHONE.

Austria's first standard electric railway was recently opened. The line extends between Tabor and Bechin, in Bohemia, and has a length of 15 miles. The maximum speed attained is only nineteen miles an hour. That passenger traffic is strictly limited in this district of Bohemia may be essayed from the statement that a train consists of only two cars, with a carrying capacity for forty passengers and thirty-six tons of goods. The new railway has a special interest from the fact that we believe it to be the first line to be entirely regulated by the telephone. There are no signals, the telephone being used by the driver in all cases to ascertain whether the line is clear. Each car is fitted with a portable instrument, which may also be used by the passengers.

At a special meeting of the Toronto Junction council, held recently, the agreement with the Stark Telephone, Light and Power Company, granting a franchise for an electric light, power and telephone service, was finally passed. The franchise provides for a telephone service at $6.00 per annum and one cent per call, with maximum rates of $25.00 per annum for business telephones and $15.00 for residence telephones, until the company has 3,000 telephones in operation in the city of Toronto, two miles distant, when the maximum rates will be increased to $40 for business and $20 for residence telephones. These rates will include a radius of fifteen miles from Toronto. The "Stark" company has already over 3,000 signed contracts for the Toronto system. The "Bell" has about 120 telephones in Toronto Junction, while the "Stark" company has already over 300 contracts.

The Virginia House of Delegates recently passed a bill requiring all telephone companies to connect with each other and exchange service. It is said similar bills will be introduced in one or more of the eastern states.



RABER & WATSON, Chicago, producers of cedar, are sending out an attractive calendar for 1904. It has a cover in color and is attractively gotten up. It will be sent free upon application.

THE CROCKER-WHEELER COMPANY, Ampere, N. J., has established headquarters for the southern representative of its Washington office, Mr. S. M. Conant, at 425 Empire Building, Atlanta, Ga.

THE H. E. LINDSEY ELECTRICAL SUPPLY COMPANY, 1007-1011 Locust street, St. Louis, Mo., announces that it has changed the name of the company from the above to the Century Electric Company.

THE BENBOW COMPANY, New York city, is sending out descriptive circulars showing the application of the "Benbow adjustable swinging telephone bracket," which it manufactures. These circulars will be sent on request.

CHICAGO NUT COMPANY, Chicago, is sending out booklets on hexagon brass nuts, lock nut binding posts and the other specialties manufactured by the company. These booklets will make a complete series and will be mailed to those interested.

THE CURRENT ELECTRIC COMPANY, Chicago, announces that, owing to the superior merits, great economy in operating and reasonable price of the Harter ringer, they are fast coming into general use. The company refers to its advertisement on page 4 this issue of TELEPHONY.

THE CROUSE-HINDS COMPANY, Syracuse, N. Y., has been incorporated with the secretary of state to take over the property and rights of the Crouse-Hinds Electric Company. The capital is $450,000. The directors are Huntington B. Crouse, Jesse L. Hinds and David B. Costello of Syracuse.

HIPWELL MANUFACTURING COMPANY, Allegheny, Pa., has recently sent out a letter to the trade which is strikingly original. We would suggest that those who appreciate a good thing write to the Hipwell company for a copy of the letter to the "Gazaza Hikers," which will be gladly mailed free.

THE INTERNATIONAL TELEPHONE MANUFACTURING COMPANY, Chicago, has recently sold a telephone equipment to the German-Swede Southern Telephone Company of Albert City, Iowa, which company has recently completed a network of lines in that section for a rural country party line telephone system.

THE MANHATTAN ELECTRICAL SUPPLY COMPANY, New York city, will be pleased to send its new price list "C," applying to catalogue No. 14. This price list takes effect December 14, 1903, and supersedes all previous quotations. This list gives the quotations on every conceivable character of electrical apparatus.

THE EWING-MERKLE ELECTRIC COMPANY, St. Louis, Mo., is sending out a large mailing card indorsed with the phrase-question, "Are You Up a Tree?" The company kindly offers to remove the obstacle in descending and suggests a remedy in its "Green Book." If this is not in the possession of any one requiring supplies, the company will mail it on application.

C. H. WORCESTER COMPANY, Tribune building, Chicago, is sending to the trade a revised telegraph code of cedar products, a book of twenty-eight pages, containing a system for telegraphing in cipher adapted to the requirements of buyers and sellers of white cedar product. The book is illustrated with views of the cedar country and is interesting and valuable. It will be sent postpaid upon request.

THE AMERICAN CONDUIT MANUFACTURING COMPANY, 413 Grant street, Pittsburg, Pa., announces a new price list and table of discounts on "American" iron-armored conduit. The main office has been moved from New Kensington to Pittsburg, Pa., and improvements have been completed at the factory at New Kensington.

H. M. DEAVITT, 159 La Salle street, Chicago, who is the chemist for a large number of telephone manufacturing concerns, is sending out a circular calling attention to his facilities for doing all kinds of analytical work. Mr. Deavitt is making a specialty of telephone experimental and analytical work and invites correspondence.

THE W. J. BARR MANUFACTURING COMPANY, Cleveland, Ohio, has issued a very interesting and instructive circular showing the different styles of transmitter arm which it manufactures. The illustrations are handsome half-tones, very clearly printed, with just a word or two in reference to the superior quality of the work which the company supplies.

THE ACME ELECTRIC COMPANY, Chicago, is making an offer on Acme apparatus during the month of January which it believes will appeal to every buyer of telephone equipment. The company asks that every exchange manager or other buyers read its advertisement on page 18 of this issue of TELEPHONY. The company invites correspondence and will send its new telephone catalogue to interested parties upon request.

COPPER GOSSIP for December, published by the National Conduit and Cable Company, New York, contains an unusual amount of new information on copper. The general business outlook, copper market situation, exports and imports, foreign and domestic markets and European copper statistics are among the different phases of the copper industry which are treated. Copper Gossip will be mailed to those interested upon request.

THE FARR TELEPHONE AND CONSTRUCTION SUPPLY COMPANY, Chicago, has recently issued a catalogue which is a decided novelty. The different sections are printed on different color paper with extended edges, making it very convenient for ready reference. The catalogue contains illustrations, descriptions and prices of everything entering into the construction of a modern telephone exchange. The catalogue will be mailed free to any address upon request.

THE STERLING ELECTRIC COMPANY, Lafayette, Ind., has issued an attractive catalogue entitled "Our Latest Conception in Switchboards," which is a complete treatise (illustrated) of the latest important addition to the Sterling's already large line of telephone apparatus. The switchboard described is for small exchanges and up to 1,000-line systems with magneto telephones. The switchboard is new in principle, novel, simple, compact, convenient and it is claimed to be operated more rapidly than any switchboard now on the market. We suggest that telephone men write the company for a copy of this latest Sterling catalogue, which will be mailed free to those who mention TELEPHONY. The edi-

tion is being rapidly exhausted and the company asks that those who desire to acquaint themselves with this new switchboard write for the catalogue at once.

MICHIGAN WHITE CEDAR, as used in making poles and ties, is the title of an interesting booklet recently issued by the Maltby Lumber Company, Bay City, Mich. The booklet contains a number of illustrations showing the method of gathering poles into the yards, shipping cedar product, etc. The official specification as adopted by the Northwestern Cedarmen's Association is given, as well as much additional information valuable to the buyer of cedar poles. The booklet will be mailed free upon request.

THE MICA INSULATOR COMPANY, 218 Water street, New York, and 117 Lake street, Chicago, Ill., will send on request a new catalogue showing samples and giving specification of "Empire" insulating cloth. This is a linseed oil cloth of high insulating quality. The company has added to its line and changed the numbers of its old grades, so that in future its cloths will be known by the numbers in this new catalogue. The company also manufactures "Linotape." This is a tape coated with linseed oil and left with an adhesive surface.

THE MONARCH TELEPHONE MANUFACTURING CO., Chicago, announce that it now has its new desk stand ready for sale and can make immediate shipment of all orders. This stand was shown in the Monarch's exhibit at the Interstate Telephone Convention, and a considerable number or orders were secured for it, notwithstanding the fact that at that time deliveries could not be made for several weeks. This new desk stand and all other Monarch apparatus is fully illustrated and described in an elaborate catalogue which has just been issued. The catalogue will be sent free upon application.

WEST DISINFECTING COMPANY, New York and Chicago, is calling attention to the merits of Telephonine and its antiseptic attachment for telephone mouthpieces, which the company claims renders telephoning safe. Both the attachment and bottle of telephonine packed in carton will be sent by the company prepaid for a dollar. The company in its advertising states: "You wash glasses, you sterilize milk, you filter water. You ought to take similar precautions with your telephone." The company will send advertising matter upon request and desires to correspond with any one desiring an agency.

THE VIADUCT MANUFACTURING COMPANY of Baltimore is calling attention to the new Skirrow telegraph switchboard. This new type of board is designed to provide a switchboard for intermediate offices and is so arranged that every switch or connection that could possibly be required might be made by any one of ordinary intelligence and without any electrical knowledge whatever. It is so constructed as to be practically fireproof, possessing high insulation. The Viaduct Company is making specially good telephones of the latest design and a line of district messenger boxes and fire alarm boxes.

THE ELECTRIC APPLIANCE COMPANY, Chicago, has recently issued catalogue No. 19, which is the company's annual catalogue of telephones, telephone material and electrical house goods. The book is one of the most complete of its kind issued, containing three hundred pages and over two thousand illustrations covering everything used in telephone construction, including switchboards, telephones, telephone parts, telephone exchange accessories, testing instruments, protective devices, cable apparatus, telephone booths, construction material, soldering material, wires and cable, tools, hotel telephone systems, etc., etc. The catalogue should be in the hands of every telephone buyer and will be mailed free by the company, together with a complimentary order book, if this publication is mentioned when writing.

THE ELMORE-FOWLER-JACOBS COMPANY, Chicago, dealers in cedar products, has recently issued in booklet form an interesting story under the title of "The Testimony of a Cedar Pole," which is of more than ordinary interest. The author is Miss Floretta G. Elmore, who is a very clever short story writer. Some of her work has appeared in this publication. To those who enjoy a thoroughly good story we recommend that they send for a copy of this book, which will be sent free by the Elmore-Fowler-Jacobs Company upon request, provided TELEPHONY is mentioned when writing.

MR. GEORGE H. MOSEMAN announces that he has been appointed selling agent for the Western Electrical Instrument Company of Newark, N. J. He will be established at 176 Federal street, Boston, Mass. In establishing a selling agent in Boston the company has responded to a demand for more direct connection with the large number of electrical engineers, electric light and power stations, educational institutions and others located throughout New England who are interested in electrical measuring instruments and appreciate the high grade of instruments for station, laboratory and testing work which this company has developed.

THE AUTOMATIC ELECTRIC COMPANY, Chicago, Ill., manufacturer of automatic telephones and automatic telephone installations under the Strowger patents, is distributing a booklet, on the front cover of which is indorsed, "In Witness Whereof We Hereto Have Set Our Hands and Seals," the cover being further illuminated by an embossed representation of the Automatic Electric Company's desk apparatus and a seal, pen and bottle of ink. This booklet contains the signed testimonials of a great number of the subscribers of the Home Telephone Company of Dayton, Ohio, which is equipped entirely with the automatic telephone system, installed by the Automatic Electric Company.

THE CENTRAL ELECTRIC COMPANY, 264-266-268-270 Fifth avenue, Chicago, recently received a mail order for Okonite pothead wire for a large telephone cable installation in the West. The construction company ordering this wire formerly used Okonite exclusively, but during the past two years had been using cheap grades of rubber covered wire. Upon investigation it was found that the cost of making over potheads made of cheap rubber covered wire, which was injured by the hot paraffine and other causes, amounted to much more than the cost of using Okonite originally. This the Central Electric Company regards as another strong evidence of its claim that "it never disappoints."

THE AMERICAN ELECTRIC TELEPHONE COMPANY, Chicago, reports an unprecedented number of switchboard shipments for the first two weeks of December. The shipments reached over 2,000 lines capacity and consisted mostly of the well-known "express" switchboard equipments. A partial list of the shipments is given below: Stanberry, Mo., two 220-line express switchboards; Gravette, Ark., one 100-line express switchboard; Russellville, Ark., one 200-line express switchboard; Buitman, Mo., one 100-line express switchboard; Sabetha, Kans., one 100-line express switchboard; Nicholsville, Ky., one 300-line express switchboard; Rushville, Mo., one 100-line express switchboard; Clark, S. D., one 100-line express switchboard.

THE STROMBERG-CARLSON TELEPHONE MANUFACTURING COMPANY, Rochester, N. Y., and Chicago, Ill., in bulletin No. 8 describes its line of non-multiple central energy switchboards. In publishing this switchboard bulletin the company has endeavored to show illustrations and drawings

of the various styles of cabinets which it manufactures for non-multiple central energy systems. Especial attention is called to the matter of equipment and the method of specifying this. In connection with the illustration of each switchboard a number of standard equipments are given and designated, as Standard Equipment "A," "B," etc. These cabinets and equipments are regularly carried in stock and the orders for these are not subject to delay, whereas special equipments are subject to more or less delay, depending upon the amount of work necessary to provide for the special orders. In addition to the strictly commercial descriptive matter there is a lot of valuable information which has been compiled for the benefit of purchasers of this class of apparatus. This information will prove of great value to parties operating small magneto or generator-call systems, or who are thinking of equipping their plants with a central energy system. The bulletin will be mailed free upon request.

Heavy buyers and constant users of dry batteries are indebted to the Wesco Supply Company, St. Louis, Mo., for an improved dry cell, which has been named the "Red Shield Dry Battery" and which is especially manufactured for telephone companies and operators of annunciators, railway signals, etc. In other words, it is particularly adapted for all open circuit work, requiring quick recuperating cell, possessing an abundance of long life and reliability. This dry battery has been placed on the market after months of labor and experiments at the factory, which was carried on for the purpose of securing materials, to produce a standard of efficiency and long life combined that would be far ahead of other dry cells that are now on the market. This battery will cost about twice as much, but it will, it is claimed, last at least three times as long as any medium-priced dry cell, and there is no question but that it will readily commend itself and force its way into general favor for all classes of battery usage. It has an E. M. F. of 1.5 volts.

The International Telephone Manufacturing Company, Chicago, has greatly extended its manufacturing plant the past season to place it in position to not only furnish its improved central energy multiple and trunking switchboard systems which were placed on the market over a year ago, but also to enable it to furnish a full line of equipment for small town and village exchanges and country party line systems. The company has completed the manufacture of a full set of special tools and machinery for making every distinct part from the crude material of its new patented self-restoring drop switchboard system for generator-call exchanges. The company has equipped a number of exchanges with this apparatus and, it is said, has received within the past thirty days orders for complete central office equipment for seventeen exchanges, aggregating over 4,000 lines. This heavy demand for its improved switchboard equipment, in addition to the rapidly increasing demand for its long distance village exchange and country party line telephones, has increased its business over 500 per cent above any previous month since the spring season. The International switchboard, it is said, embodies many new features made under the company's letters patent and contained in no other equipment, making it one of the most substantial, positive and reliable equipments of its kind on the market.

The World's Fair Art Catalogue, issued by the Central Telephone and Electric Company, St. Louis, Mo., is a new departure in telephone literature. The illustrations are very fine and attractively arranged, while the information in the book is valuable and timely. In the introduction to the catalogue the company says:

"In compiling this, our latest catalogue, it is our aim to place in the hands of our friends and customers a catalogue that will show the progress in construction of our goods, and furnish at the same time a few illustrations of the buildings to be used for exposition purposes at the World's Fair, which will be held in St. Louis during the summer of 1904 in commemoration of the Louisiana purchase, thus shownig the progressive spirit of our city, which, as a general market and base of supplies, now stands second to no city in the world. We are the representative telephone manufacturers and dealers in telephone supplies in St. Louis, and as such we shall always keep abreast of the times, giving our customers the most up-to-date instruments at prices to meet any legitimate competition—with quality considered. We solicit your inquiries and orders on a business basis and ask only equal consideration with any competitor to satisfy you that we give full value."

The company will gladly mail this art catalogue to any telephone man upon request.

The Monarch Catalogue issued by the Monarch Telephone Manufacturing Company, Chicago, is one of the handsomest and best printed telephone catalogues which has come to our notice. It contains illustrations and descriptions of the full line of Monarch apparatus. In the preface the company says: "In compiling this catalogue for presentation to the telephone public we have endeavored to prove, by a statement of facts, that the apparatus we are manufacturing embodies all the points of merit we claim for it. That all 'Monarch' apparatus is honestly and conscientiously made is well known by every one familiar with its construction or operation. We have spared neither expense nor pains to have our telephones as perfect in every detail as it is possible to make them. We use the best of material throughout and take particular pride in the excellence of the workmanship. Our telephones have been designed by men who have been in the telephone business since its inception and who thoroughly appreciate the value of simple, durable and efficient apparatus. We have carried out these three fundamental principles in all our work and have placed on the market a line of instruments which we know will give absolutely reliable and lasting service and upon which we can place our guaranty. We are always glad to furnish any information desired and respectfully solicit your correspondence." The catalogue will be sent to any address in the world postpaid.

The Sumter Telephone Manufacturing Company, Sumter, S. C., reports the following recent orders: A 600 drop Sumter "Bull's Eye" express switchboard equipped with electric flash light trunking system for the People's Telephone Company, Morgantown, W. Va.; 100-line switchboard, Virginia and Tennessee Telephone Company, Pulaski, Va.; 100-line switchboard, Head Telephone Company, Grande View, Texas; 200-line switchboard, Virginia and Tennessee Telephone Company, Christiansburg, Va.; 100-line switchboard, Caroline Telephone Company, Caroline, N. C.; 100-line switchboard, Macon Electric and Telephone Company, Macon, Miss.; 50-line switchboard, Dent Telephone Company, Lometa, Texas; 100-line switchboard, Austin Telephone Company, Marshville, N. C.; 50-line switchboard, Cavett Bros., Brookville, Miss.; 100-line switchboard, Greenville Independent Telephone Co., Greenville, Tenn.; 200-line switchboard, Kissimmee Telephone Company, Kissimmee, Fla.; 50-line switchboard, Charity Hospital, New Orleans, La.; 100-line switchboard, Frederick County Telephone Company, Brunswick, Md.; 400-line switchboard, with flash light transfer system. Monroe Telephone Company, Monroe, N. C.

In addition to the above it has placed quite a number of switchboards and telephones in Canada through its special agents, the Mechanics' Supply Company of Quebec, and in Washington, D. C., through the National Electrical Supply Company. It has recently furnished a 200-telephone central

energy hotel annunciator system for a large apartment house. In the west, through its special agents, the Ewing-Merkle Electric Company of St. Louis, Mo., it has also furnished a large number of telephones, as well as many other telephone shipments extending throughout the United States and Mexico. It has also just entered a second order from the United States government for several hundred army service telephones.

A CONVENTION FEATURE.

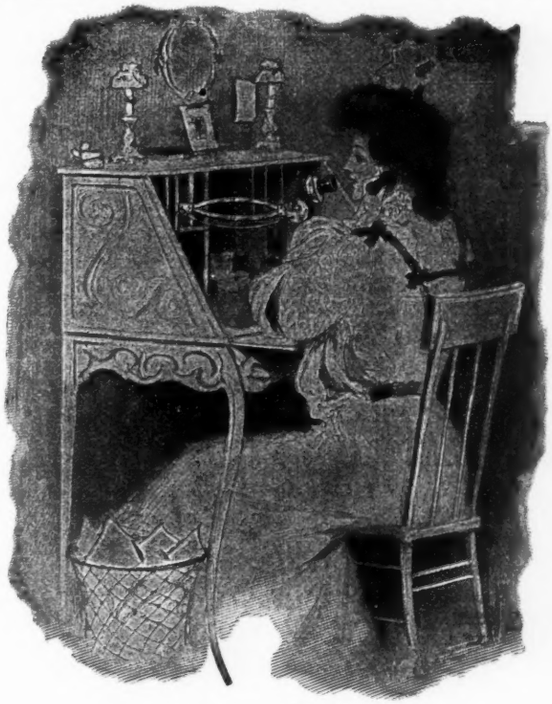
One of the features of the recent interstate convention was the practical demonstration of the efficiency of the Novelty splices, they being absolutely moisture-proof. This was proved by a practical demonstration of a sleeve and two pot heads immersed in water, to which was attached a Wheatstone bridge and a galvanometer. The Johnson Telephone Company, Iowa City, Iowa, on the strength of this test, gave the New Haven Novelty Machine Company an order for a complete plant. The New Haven Novelty Machine Company will shortly place upon the market a split sleeve to satisfy the large demand. The company invites correspondence and will send descriptive matter and prices on the entire product upon request.

THE ADJUSTAPHONE.

The accompanying illustrations are taken from the cover page of a very attractive little brochure sent out by the Chicago Writing Machine Company describing the merits of the Adjustaphone. This instrument has attracted more attention among telephone manufacturers and users of tele-

THE ADJUSTAPHONE.

phones than any apparatus which has recently been put on the market. As it is an instrument which can be used in connection with any system, and with any transmitter and receiver, it has naturally been a revelation to all managers of exchanges, and it is a notable fact that there have been absolutely no unfavorable criticisms offered. Furnishing as it does an ideal service, both from the standpoint of the subscriber and telephone company, the Adjustaphone bids fair to hold securely the popular favor it has already won. From the manager's standpoint its chief attraction is the reduction in the cost of maintenance of the heretofore destructible desk set. As one manager expressed it, "We have been obliged to stand off subscribers who demand desk sets with a shotgun, for we could not afford to put in a telephone which they broke almost as fast as we could replenish them." The Adjustaphone, therefore, has removed the cause of many gray hairs for managers all over the country. Every exchange which has put them in (and the orders received show that they will number in the thou-



THE ADJUSTAPHONE.

sands) have found them to be all the manufacturers claim for them. The slogan, "No more broken desk sets, no more twisted cords," has been published broadcast and the far-seeing companies have taken this means of adding dollars to their dividends. It is expected that the beginning of the year will find all those who have not yet proved to themselves the merits of the Adjustaphone, sending in their orders and presenting their subscribers with what appears to be the most convenient and best form of desk instrument now manufactured.

The Chicago Writing Machine Company, who are located at 87 Wendell street, Chicago, Ill., will be glad to furnish further information and descriptive matter on application.

THE GOLD TELEPHONE.

It is said that the gold telephone exhibited at the recent interstate convention is to be presented to President Roosevelt by the Chicago Writing Machine Company, Chicago. This telephone was one of the convention features and was much admired.

BELLE ISLE TELEPHONES.

TELEPHONY, Chicago, Ill.: We have read with much interest your article on page 487 of the December TELEPHONY entitled "Telephones for Belle Isle." Inasmuch as we supplied the material and apparatus and it was by following our suggestions that they were able to have this line placed for winter communication, it might perhaps be of interest to you to know how the line was built. Belle Isle is a "desperate mass of rock, partially covered with moss and producing no wood of any kind," and as there was no time to erect poles, we suggested the use of No. 12 heavily braided weather-

proof wire, together with a large supply of tape for extra wrapping on bad places. The telephones used were 1,000 ohm Sumter Telephone Manufacturing Company bridging instruments. Our object in supplying No. 12 weather-proof was that in the case of erection of poles next year it would be possible to use the same wire. These instruments were installed with grounded terminals and they give entire satisfaction. Yours very truly,

MECHANICS SUPPLY COMPANY, PER GUY H. SIMPSON.

THE FALLER AUTOMATIC TELEPHONE EXCHANGE.

The Faller automatic telephone exchange system was devised by E. A. Faller to meet the requirements of telephone service, as the public demand is for accurate, rapid and private telephone communication. In addition to this the necessity for large economies in operation and construction, in order to meet competition and pay interest on investments, is becoming a vital problem. A brief statement of the advantages of the Faller semi-automatic system and the results to be obtained by its use, as claimed by the company, may be of interest:

"The ordinary commercial subscriber's instrument is employed in the operation of the semi-automatic, without any modification in either construction or wiring. Each subscriber is provided with a mechanical signal transmitter called a 'sender,' by means of which the required number is sent to the exchange. This sender can be placed beside the telephone or in any convenient position. It consists of a box 5x5 inches, on the face of which are a number of rings side by side, which revolve on a center, each ring having the numerals from 0 to 9. On the side of the box is a knob, and when the subscriber wishes to call a number he quickly sets the numerical rings so that the desired number is displayed across the sender, and then gives the knob a turn. This is the only operation he performs. The act of turning the knob gives him control of the line. When the connection is established, which is in about four seconds, his bell rings once, indicating that he may take down the receiver and converse, or two rings will indicate that the line is busy. In the latter case he can repeat his call by giving the knob another turn, as the required number is already set.

"The advantages gained by the subscriber are easily seen. The service is very much quicker and not subject to the mistakes made by transmitting numbers vocally. It is unnecessary for the subscriber to stand at the telephone, holding the receiver to his ear while the connection is being made. If his line is busy and he calls a number with which he is not familiar, he does not have to resort to the directory in order to make the call again, as it stands before him on the sender until he wishes to call another subscriber.

"There is no conversation between the subscriber and the exchange, absolute secrecy in telephoning is maintained and, in short, the subscriber has all the advantages of an automatic service.

"Considering the system from the central exchange standpoint, there are the following advantages:

"The operation is accomplished entirely by signals and there is no conversation between the operators. The operator plugs wherever a signal light appears and attends to her keys.

"The operation is more mechanical than in the multiple system and consequently the strain on the operator is not nearly as great, so she can maintain her best efficiency throughout working hours.

"One operator in the Faller system can do the work of several operators in the multiple system and the cost of operation is cut down from one-half to two-thirds.

"There are no multiples in this system and a very large percentage of the apparatus now used in the multiple system is superfluous and can be utilized for enlarging present exchanges or installing new ones. The operators do not require any transmitters and receivers are also unnecessary,

"The system can be enlarged without a multiplicity of construction, there being only one terminal for each subscriber in an exchange, irrespective of size. The increase in cost of construction is in a direct ratio to the increase in capacity, instead of a rapid increase in cost over increase in capacity.

"Any companies installing new exchanges and only willing to use a manual system will save the greater part of the cost of construction by using the Faller system, because of the entire absence of multiples.

"Some of the benefits to the operating companies using this system will be as follows:

"First—They will utilize their present equipment to give the best and swiftest automatic service.

"Second—They will effect great economies in the cost of operating.

"Third—They will have a large surplus of their present apparatus for increasing the capacity of their present exchanges or for use in new ones.

"The incomparably better service can only be appreciated by experience, and it is quite apparent that where there are two companies in competition the Faller system will give to the one using it very great advantages.

"We believe that the time is fast approaching when the manual switchboard will be a thing of the past and that this semi-automatic system is the next step to that end."

BELL SCHEME DEFEATED.

For some time past the Business Men's Association of Jonesboro, Ind., have been considering the telephone situation at that place. A meeting to determine their action was called recently and the deep interest felt in the subject was shown by an unusually large attendance, nearly every member being present. Several gentlemen were also present upon invitation of the association, among them being O. Rex of North Manchester; Mr. Morris of the Independent exchange at Lafontaine; Woodward and Haymaker of Defiance, Ohio, who built the exchanges at Gas City and Jonesboro; A. V. Overshiner of Chicago, representing the Swedish-American Telephone Company, who furnished the switchboard and telephones for those exchanges, and Hon. G. A. H. Shideler, who is interested in the United Telephone Company of Marion.

After an informal discussion of the situation, participated in by all the gentlemen present as well as the members of the association, the action of the business men of Jonesboro was unanimously decided on and the president and secretary were directed to formulate a report in accordance with that decision, which they did by adopting the following report:

JONESBORO, IND., Dec. 15, 1903.

Whereas, the Central Union (Bell) Telephone Company has submitted to the Business Men's Association of Jonesboro a proposition which provides in substance that if the members of this association will adopt the Central Union telephone and discard those of the Home Telephone Company, which we are now using, that the Central Union will furnish residence telephones in this city at a slight reduction from the rate we now pay the Home company, and will furnish free service to the members of this association for a limited time, and at a slight reduction thereafter from the rates we are now paying, and will also permit free service to all the Central Union patrons in Grant county; and

Whereas, This association has had said proposition under consideration for some days and investigated the same as thoroughly as the time and facilities at our disposal would permit, and as a result of such consideration and investigation we find as follows:

First. For several years the Central Union was the only

company giving telephone service in our city, and the service they always furnished was extremely poor and unsatisfactory, the number of patrons was small and the cost very high.

Second. The Home Telephone Company about one year ago began furnishing us service through its new exchange furnished with Swedish-American equipment and long distance telephones, and its service has always been much better than was ever furnished by the Central Union exchange, with a patronage about twice as great as we could formerly reach through the Central Union exchange, and at a cost much below what we formerly paid.

Third. We find that in all the surrounding towns and counties the Independent telephone systems with which the Home Company is connected have a much larger list of patrons than has the Central Union and that in the counties adjoining our own the Independent telephones outnumber the Central Union about ten to one; therefore

Resolved, That the proposition made to this association by the Central Union be rejected and that we continue our support and patronage to the Home Telephone Company of Gas City and Jonesboro. E. N. Pierce, Pres.

David Holmes, Sec.

TELEPHONE TIME STAMPS.

Owing to the growing demand for time stamps for timing toll messages, the Baird Manufacturing Company of Chicago, makers of Baird pay stations, have just brought out a new model telephone time stamp which has already found favor among telephone companies. This machine prints the time to the exact quarter minute and by means of a simple

BAIRD TELEPHONE TIME STAMP.

device the elapsed time can be computed at a glance. By means of special guides fitted on the top plate almost any form of ticket can be used. The superior clock movement is strong and reliable. The case is so designed that it can be dropped into a hole in a switchboard if desired. Samples of this machine will be sent out to telephone companies on thirty days' trial if desired.

COMBINATION INDEPENDENT DIRECTORY.

The Inter-Ocean Telephone and Telegraph Company, 336 Ellicott square, Buffalo, N. Y., has issued the first edition of a combination directory of the Independent telephone companies in the Buffalo-Rochester district in western New York. This directory contains all the names of subscribers to the local Independent telephone exchanges which are connected directly with the Inter-Ocean Telephone and Telegraph Company's long distance service. During the past two years there has been great activity in the central and western New York districts in the development of Independent telephone systems. It is a remarkable fact that there are now in operation in western New York 50,000 Independent telephones, all of which are at present, or will soon be, connected with the Inter-Ocean company's lines.

This directory has been carefully prepared and is an important addition to the business directories of the country. While the edition is limited, extra copies have been printed for distribution outside of the district covered by these exchanges, and the book can be secured by remitting fifty cents in stamps to the Inter-Ocean company at Buffalo, N. Y.

MESSAGE RATE SYSTEM FOR PARIS.

In France it is the practice for various members of the Chamber of Deputies to make reports on the items of receipts and expenditures which go to constitute the general budget, and in conformity with this a report on the postal telegraph and telephone services has been made for the year 1903 by M. Marcel Sembat. A very interesting portion of this report deals with what may be called the telephone crisis in Paris, and some of the observations made in regard thereto are of interest not only to telephone engineers in America, but to those engaged in the art throughout the world. Mr. Sembat notes the fact that the subscription rate in Paris is 400 francs, or $80, and that the administration had promised to reduce this flat rate to 300 francs, although nothing of the kind has been carried out. The flat rate in Paris allows an unlimited number of conversations with all subscribers within the Paris exchange proper and all within the municipal boundary of Paris, which embraces 48 exchanges. There were in Paris on October 31, 1902, 29,478 main stations at 400 francs each, 261 state service stations paying 200 francs, 525 departmental service paying 300 francs, 52 season subscribers paying 200 francs, 51 interurban or toll line stations at 150 francs, and 9,988 extension lines to main lines paying 50 francs. This makes a total of 40,555 stations, or only 1.49 stations for every 100 inhabitants, this being much lower than usually obtains in other cities in Europe and far below what prevails in the United States. The apparatus, with the exception of the batteries, is furnished by the subscribers, but the maintenance is at the cost of the state. The patronage of the system, moreover, is not very extensive, as it appears that the daily use of the instrument does not reach above five conversations on the part of 53 per cent of the subscribers, while less than 9 per cent use the telephone more than 15 times a day.

Under these circumstances Mr. Sembat advocates the message rate system, which he states is already in use exclusively or combined with a flat rate in the United States, Australia, Japan, Germany, Denmark, Switzerland and Great Britain, and he points out also the remarkable increase in the yearly number of subscribers which has occurred as the result, instancing New York City.

What is said to be the first instance of the admission in an Indiana court of conversation over the telephone to establish the identity of a party at the other end of the line, occurred in the case of Rosenthal & Co. v. William Beckwith, at Terre Haute, October 27th last. A witness was produced at the trial who had had conversation over the telephone with Beckwith and in verification of the fact that he really was talking with defendant said that he knew it to be true from the sound of the voice. The trial judge admitted this statement to establish the identity of the parties. The witness said he was willing to take his oath that he was talking with Beckwith and the court thought that the fact was sufficiently proven.

THE ELECTROPHONE.

The "electrophone" is no new invention, and, in fact, the employment of a microphone for the purpose of transmitting music and public speech through telephone lines dates back to the earliest days of telephony. Yet it is only recently that it has been employed for commercial purposes to replace the telegraph for transmitting newspaper reports of speeches. A demonstration of the practical manner in which it may be applied for this purpose was given by the London Evening News recently. Mr. Chamberlain spoke at Birmingham for nearly two hours, and concluded his speech at 10:05 p. m. At 10:32 p. m. an edition of the Evening News was issued with a verbatim report of the speech. The system employed was precisely similar to that described in our issue of October 9, with the exception that head-gear receivers were worn by the reporters sitting in the Evening News offices. All the arrangements made by the Post Office and the National Telephone Company worked without a hitch. If the telephone trunk lines were used more frequently for similar purposes, the telephone department of the Post Office would benefit as well as the newspapers and general public, for the night load on the lines would utilize capital otherwise lying idle for several hours out of the twenty-four, and the result should be a general cheapening of the trunk service.—*London Electrician.*

PROPOSING BY TELEPHONE.

A Chicago banker recently made a proposal of marriage to a lady in Cadiz, Ohio, over the long-distance telephone, and received an acceptance of his proposal in the same manner. It worked all right in this instance, and they will soon be married, no doubt, and live happy ever after, says the Los Angeles Herald.

But think of the risks a man runs when he proposes over the telephone. He might get the wrong party, by mistake, and being unaware of it propose to the wrong party. It requires no strain on the imagination to see where that would land him.

That, however, is not where the great danger lies. We'll assume that he already has got the right party, and the first greetings are over, and he has again reassured her on the subject of his undying love, and she has come back at him, good and strong, with an avowal of her great faith in him, and some expressions of unbounded affection. That's all over with, remember, and he is trying to think what to say next, and just about at the point of risking all, and saying the fateful words. He clears his throat and says: "Er—ahem!—Clara, I——"

"Bur-r-r-r-r-r-r-rup!" goes the telephone. Then a strange girlish voice comes; a voice that he has never heard before. It says: "Did you get the party you asked for?"

"Hang it all; no, I hadn't asked her yet—that is—no, yes, I mean—what the devil is it to you, anyhow?"

"I asked if you got your party?" The tone is a trifle resentful.

"Oh, you mean—yes, yes; I did have her, all right—don't cut me off again."

"Bing! Chuck!" Then a long silence.

"Hello."

"Hello."

"Is that you, dear?"

"Yes, this is me. Is that you?"

"Yes. I was just about to say—that is, I was going to ask——"

"Bur-r-r-r-r-r-rup!"

"There's your party again."

"Here, what the deuce do you mean by——"

"Oh, George! What are you saying? I——"

"Hello, is that you? I thought it was that other girl."

"Why, George, you just said——"

"Buz-z-z-z-z-zip!"

"I want Main 94257, please."

"Main 942-z-z-z-zip!"

"Chug!"

—"and I don't know what to make of it, dear."

"Neither do I; this telephone isn't working right. I had something very important to say to you, darling, but——"

"Are you sure it wasn't that other girl you were going to say it to?"

"Nope, ain't sure of anything. I've forgotten what it was, anyhow. I'll call you up again, later. Good-by."

"Good-by."

And that might be the end of it all.

THE RURAL TELEPHONE.

With the gradual evolution that is taking place in every branch of business the dealer must ever be alive and in the forefront to avail himself of every facility to add to his trade. The many extensions of the telephone into the rural or farming sections in many parts of the country open up a new method of securing business. With a number of farmers on a telephone line that also has a connection in the stores of the retail hardware dealer, the grocer, dry goods merchant, etc., a goodly percentage of their business should be had. Especially would the farmer avail himself of the opportunity during the busy season to order hardware and implement supplies from the hardware dealer. By the use of a co-operative delivery the orders could be sent on certain days to a specified route. If the farmer desired a certain part of an implement, for which the dealer had to send to the factory, the want could be telephoned to town, the part ordered and its arrival telephoned to the farmer, who could then make arrangements for its delivery.

Many may remark that this is too visionary, but the fact remains that in some parts of the country this method is being pursued with highly satisfactory results.—*Hardware Dealers' Magazine.*

LIFE WITHOUT THE TELEPHONE.

It has sometimes been asked, "What would a city do if suddenly its telephone service were removed?" Business and social conditions have become so interwoven with the use of the telephone that a sudden suspension of it, it is believed, would not only cause great inconvenience, but a commercial loss. It would interfere with and delay business and be a decided check to trade and commerce. The suppositious case is now a reality in Kansas City, where a fire recently burned all the toll boards and damaged the main switchboard so that for at least thirty days, and probably for two or three months, there will be no telephone service in the business district, and no toll or long distance service between Kansas City and any outside town or city for the same length of time. The Kansas City citizens will now come into a fuller comprehension of the many-sided and all-around utility and convenience of the telephone. It is to be regretted that there is no reliable statistical agency by which the actual loss to the trade, commerce and industries of Kansas City during the interim could be ascertained.

SELLING GRAIN BY TELEPHONE.

These days of private telephones and telegraph lines to every station and almost every big farm throughout the Dakotas have brought the farmers into touch with the terminal grain markets of Duluth and Minneapolis in such a way as to euchre the country elevator lines out of all chance of profits by advance information, says a press item. Often the changes in quotations at either Duluth or Minneapolis are in the hands of farmers at their homes within ten or

twenty minutes after they have been made, and in some cases elevator companies having country line houses have found it very difficult to keep even with the farmer. This is especially the case with a long-continued advance or decline. A farmer will store his grain in the country house nearest his farm, and as long as prices advance or remain stationary he will let it stay there, taking a storage ticket, which he leaves with a friend in town or at the bank. Being in such close touch with the terminal markets by telephone, he knows at once of any change in price, and if it is a decline he at once telephones to the bank or his agent to sell at the old price, and this is done so quickly that the sale is often made before the country elevator has received word by wire from Duluth to make a change in quotations. In that case the elevator line is out the difference in price, as it has to sell its grain on the terminal market at once."

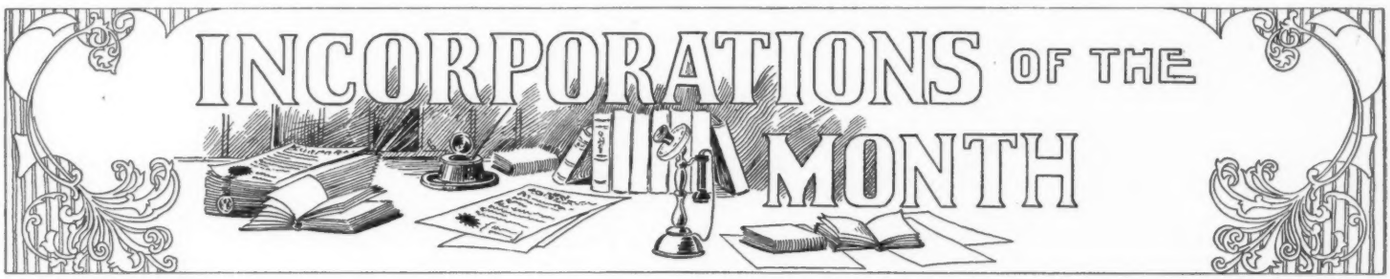
GUERNSEY TELEPHONES.

Although Guernsey has recently achieved a somewhat unenviable reputation as the home of registration for stray wild cats, it seems to manage its State telephone department very satisfactorily. The report on the operations for last year shows that 1,073 lines (exclusive of junction lines) were working, which gives one telephone to every 37½ inhabitants. The cost of establishing this system was £18,850, or £17 11s 4d per line, while the total revenue was £3,483, of £3 4s 11d per line, which shows that the Guernsey people must get their telephones at very cheap rates. Expenses, including postoffice royalties and provision for capital sinking fund, interest and depreciation, amounted to £2,718, and after placing £195 to a special contingency fund there still remains £157 as clear profit. It is not much; but it shows what can be done with a small system by careful management, and it should, perhaps, make the people of Tunbridge Wells, for instance, think that they were a trifle hasty in abandoning their Independent system after it had once been established.—*Pall Mall Gazette.*

MARRIAGE BY TELEPHONE.

Of course, it was an Atlanta lady who recently married by telephone. She was visiting in a Pennsylvania town and the man was in New York. A fortune of $20,000 depended upon instant wedlock and the Atlanta girl was up to the exigency. At each end of the line preachers were stationed and the ceremony was performed. This was somewhat in the line of Gen. John A. Logan's conversation. He was running for United States senate and an urgent message was sent to him by wire to Washington that unless he joined the church he could not be elected. He made the necessary connection by telegraph and joined the church. It would have been by telephone, but in those days the invention was still unknown.—*Shelby County Democrat.*

Glasga's telephones hae survived an ither year o' opposition, an' they hae a profit o' £1,691 on the year's workin'. There are noo 9,122 telephones up, an' some hunders o' orders to gang on wi'. True, some o' the faut-findin' folk say the telephone system is bankrupt, because when the government taks it ower in 1913, as they're to dae, they'll gie naethin' for the plant or the lines worth speakin' o', an' there'll be a dead loss on the haill thing. But the telephone is just as safe as the tramways, an' that safe eneuch. Even if it disna pay itsel' afore 1913, its funeral expenses winna be heavy an' it has already done guid service to the public, if only by makin' the auld company sit up an' gie a better service. But some folk can ne'er admit that onything the corporation daes is richt.—*Montreal Star.*



Ellington Telephone Company, Miller, Ia.

Farmers' Telephone Company, Woden, Ia.

Citizens' Telephone Company, Bloomfield, Ia.

Huntland Telephone Company, Huntland, Tenn.

Farmers' Telephone Company, Silver's Mills, Me.

Marion Township Telephone Company, Gunder, Ia.

People's Rural Telephone Company, Wenonah, N. J.

Farmers' Mutual Telephone Company, Pocahontas, Ia.

Farmers' Mutual Telephone Company, Birmingham, Ia.

Stanton Southwestern Telephone Company, Stanton, Ia.

Allen Telephone Company, Allen, Mich. Capital stock, $4,500.

Paxico Telephone Company, Paxico, Kans. Capital stock, $5,000.

Hastings Telephone Company, Hastings, Ohio. Capital stock, $3,000

Lawrence Telephone Company, Lawrence, Nebr. Capital stock $1,000.

Cliffdale Telephone Company, Cliffdale, N. C. Capital stock, $5,000.

Commercial Telephone Company, Baltimore, Md. Capital stock, $50,000.

Carbondale Telephone Company, Carbondale, Kans. Capital stock, $2,000

Mathews Telephone Company, Mathews, Ind. Capital stock, $15,000.

Rock Creek Citizens' Telephone Company, Rocky Creek, Ohio, organized.

Newport, Hammond and Southern Telephone Company, Newport, Nebr.

Liberty and Jackson Telephone Company, Liberty, Pa. Capital stock, $5,000.

Venters Telephone Company, Venters, Ky., organized. Capital stock, $7,000.

Northwestern Telephone Company, Canandaigua, Mich. Capital stock, $1,400.

Williams Telephone & Supply Company, Cleveland, Ohio. Capital stock, $50,000.

Somerset and San Antonio Telephone Company, Somerset, Tex. Capital stock, $3,000.

Stark Telephone, Light and Power Company, Toronto, Ont. Capital stock, $1,000,000.

Graettinger Telephone Company, Graettinger, Iowa, organized. Capital stock, $10,000.

Grimmell Telephone and Manufacturing Company, Huron, Ia. Capital stock, $200,000.

Hubbard and Farmers' Mutual Commercial Telephone Company, Zearing, Ia., organized.

Tripp Telephone Company, Tripp, S. D. Incorporators, A. D. Long, Fred Reichman, E. C. Ward.

People's Telephone Company, Tulare, Cal. Incorporators, William Swall, Fred Hesse and others.

Lacona Telephone Company, Lacona, Ia., organized. J. A. Pogue, president; E. C. Jones, secretary.

Leaf River and Eagan Mutual Telephone Company, Leaf River, Ill., organized. David Kretsigner, secretary.

Uniontown Telephone Company, Uniontown, Wash., organized. President, Paul Fuchs; secretary, L. F. Darr.

Malvern Telephone Company, Malvern, Ark. Capital stock, $8,000. Incorporators, W. H. Cooper and others.

Pleasant Ridge Telephone Company, Coin, Ia. Capital stock, $1,950. Incorporators, C. H. Henderson and others.

Flanagan Telephone Company, Flanagan, Ill. Capital stock, $800. Incorporators, H. F. Mette, J. H. Linneman, D. Whalen.

Greensburg Telephone Company, Greensburg, Kans. President, L. M. Day; secretary Floyd Burt; treasurer, Geo. C. Price.

Phelps County Telephone Company, Holdredge, Nebr. Capital stock, $40,000. Incorporators, H. W. Barber, C. W. Steiger.

Mutual Telephone Company, Vineland, N. J. Capital stock, $25,000. President, Henry Taylor; secretary, W. D. Wilson.

Meron Telephone Company, Meron, Ind. Capital stock, $10,000. Incorporators, G. W. Stanley, W. J. Cooper, George McNab.

Greensburg Telephone Company, Greensburg, Kans. President, L. M. Day; secretary, Floyd Burt; treasurer, Geo. C. Price.

Russellville Telephone Company, Russellville, Tenn. Capital stock, $10,000. Treasurer, M. Drummond; secretary, A. Bernard.

Medora Telephone Company, Medora, Ill. Capital stock, $10,450. Incorporators, John A. Payne, Oliver P. Erwin, William J. Bell.

Readstown Telephone Company, Readstown, Wis. Capital stock, $5,000. Incorporators, F. N. Groves, G. W. Heinke, C. W. Reeve.

East Carthage Telephone Company, Carthage, Ill. Capital stock, $2,100. Incorporators, O. W. Cutler, C. C. Wright, Samuel Curry.

Southwestern Iowa Telephone Company, Hamburg, Ia. Capital stock, $15,000. C. D. Butterfield, president; R. C. Campbell, secretary.

San Pierre Telephone Company, San Pierre, Ind. Capital stock, $5,000. Directors, William Sweltzer, Fred J. Weinkauf, Henry A. Smith.

Grant Township Mutual Telephone Company, Boxholm, Ia. Capital stock, $10,000. President, Alfred Sunberg; secretary, Alex. Westeen.

Wick, Congor and Clanton Valley Telephone Company, St. Charles, Ia., organized. President, Oscar Springer; treasurer, Sam Shreves.

Hartsgrove Citizens' Telephone Company, Hartsgrove, Ohio. President, Robert Marro; secretary, L. W. Lee; treasurer, J. V. Wilson.

Hartsgrove Telephone Company, Hartsgrove, Ohio, organized. President, Robert Marro; secretary, L. V. Lee; treasurer, J. V. Wilson.

Wick, Conger and Clanton Valley Telephone Company, St. Charles, Ia., organized. President, Oscar Springer; treasurer, Sam Shreves.

Arrowsmith Telephone Company, Saybrook, Ill. Capital stock, $1,000. Incorporators, Charles E. Hurst, James A. Taylor, Walter Johnson.

Henderson Prairie Farmers' Mutual Telephone Company, Postville, Ia. Capital stock, $3,000. Incorporators, E. T. Henderson and others.

Tiffin Home Telephone Company, Tiffin, Ohio. Capital stock, $125,000. Incorporators, E. L. Barber, E. B. Meyers, T. S. Kientz and others.

La Plata Telephone Company, La Plata, Mo. Capital stock, $1,500. Incorporators, J. A. Dudley, D. C. Seaman, R. B. Enyant and others.

People's Independent Telephone Company, Cameron, N. Y. Capital stock, $6,000. Incorporators, Frank L. Johnson, Wm. Bowyer, Griff W. Jack.

Egyptian Telephone and Improvement Company, Fairfield, Ill. Capital stock, $2,500. Incorporators, C. M. Brock, Luke Whitson, John H. Morlan.

Russellville Telephone Company, Russellville, Ark. Capital stock, $10,000. Incorporators, R. M. Drummond, Wm. Rowan, A. Barnard, A. C. Brown.

Farmers' Telephone Company, Deer Grove, Ill., organized.

Belleville Independent Telephone Company Belleville, Kans. Capital stock, $35,000.

Greene County Telephone Company, Worthington, Ind. Capital stock, $10,000. Incorporators, S. A. Dayhoff, Henry W. Cooper, Z. P. East and others.

Specialty Manufacturing Company, Cleveland, Ohio. Capital stock, $10,000. Incorporators, A. H. Cutter, W. L. Cott, Fred N. Smith, N. M. Ely, E. E. Lytle.

Hannibal and Ralls County Telephone Company, Hannibal, Mo., organized. Capital stock, $600. Directors, J. F. Davidson, Dr. W. L. Birney, T. H. Harper.

York Telephone Company, Nelsonville, Ohio. Capital stock, $1,000. Incorporators, W. S. Wollett, J. G. Filley, J. W. Bennett, E. H. White, J. M. Bennett.

Chesterhill and Brown's Mill Telephone Company, Chesterhill, Ohio, organized. President, Ferd McInturf; secretary, S. B. Zumro; treasurer, Henry Hopkins.

Dewey-Wareham Telephone Company, Manhattan, Kans. Capital stock, $50,000. Incorporators, C. P. Dewey, Chicago, and H. P. Wareham, Manhattan, Kans.

Hoopole, Yorktown, Tampico and Thomas Telephone Company, Yorktown, Ill. Capital stock, $4,900. Incorporators, F. E. Toy, Wm. Thomas, Thomas Burton.

Nickerson Telephone Company, Nickerson, Kans., organized. Capital stock, $5,000. President, W. F. Williams; treasurer, F. C. Brown; secretary, C. S. Gibbons.

American Telegraphone Company, Washington, D. C. Capital stock, $5,000,000. Incorporators, Stilson Hutchins, Lee Hutchins, Z. R. Babbitt and Wm. J. Dante.

Courtland Telephone Company, Courtland, Kans. Capital stock, $2,500. President, J. E. Tucker; vice-president, S. L. Lipton; secretary and treasurer, C. A. Kimball.

Ripley Automatic Telephone Company, Ripley, Okla. Capital stock, $15,000. Incorporators, Richard P. Woolridge, Edward Johnson, John P. Himkel, Frank Shay.

Central Mississippi Telephone Company, Louisville, Tenn., organized. Capital stock, $30,000. Incorporators, W. H. Woodward, W. C. Wright, A. L. Jagor and others.

Bruckner Telephone and Electric Company, New York, N. Y. Capital stock, $15,000. Incorporators, Frederick C. Bruckner, Charles B. Gwynn, W. Gibbs Whaley.

Mt. Victory Telephone Company, Mt. Victory, Ohio. Capital stock, $25,000. Incorporators, J. N. Richardson, J. J. Boone, H. E. Dickinson, William Montz, M. B. Boone.

Deer Creek Mutual Telephone Company, Independence, Okla. Capital stock, $2,500. Incorporators, W. R. Cooper, A. W. Brown, M. A. Bates, I. H. Wilmeth, C. T. Gentry.

Norwood Citizens' Telephone Company, Norwood, Ohio. Capital stock, $10,000. Incorporators, P. H. Shortall, Charles M. Jones, Fred Fangman, W. S. Trut, John J. Cushing.

Ohio Telephone and Telegraph Company, Brilliant, Ohio. Capital, $20,000. Incorporators, J. C. Gilchrist, Robert Carpenter, James L. Cox, Charles J. Waddell, Fred L. Dougall.

Beaver Valley Telephone Company, Beaver, Pa. Directors, John M. Buchanan, Agnew Hice, Robt. W. Darragh, John H. Miller, James J. Mitchell, Henry M. Camp and others.

Hillsborough and Montgomery Telephone Company, Bellemead, N. J. Capital stock, $125,000. Incorporators, Peter A. Garretson, Wm. C. Hendrickson, Louis P. Opie and others.

Thompson Valley Telephone Company, Hokah, Minn., organized. President, Albert Marquardt; vice-president, Charles Holliday; secretary, M. E. Sullivan; treasurer, Charles U. Kellogg.

Ohio Valley Telephone and Telegraph Company, Brilliant, Ohio. Capital stock, $20,000. Incorporators, J. G. Gilchrist, Robert Carpenter, James L. Cox, Charles J. Waddell, Fred L. Dougall.

Salt Lake and Bristol Telephone Company, Bristol, Ia. Capital stock, $5,000. President, Ole T. Groe; vice-president, C. K. Paulson; secretary, A. T. Groe; treasurer, Octavius T. Groe.

United Telephone Company, Hartford, S. D., organized. President, Martin McLeod; vice-president, F. E. Van Demark; secretary and superintendent, D. W. Greatorex; treasurer, E. W. Nanson.

Bangor Automatic Telephone Company, Bangor, Me., organized. Capital stock, $250,000. Charles F. Bragg, president; A. A. White, vice-president and general manager; James A. Boardman, treasurer and clerk.

Citizens' Telephone and Telegraph Company, Evanston, Ill. Capital stock, $15,000. Incorporators, James E. Keelyn, W. S. Mason, Schuyler J. Stratton, C. A. Wightman, B. B. Noyes, W. J. O'Connell, Thomas E. Conner.

North Arkansas, Southwest Missouri and Indian Territory Telephone Company, Siloam Springs, Ark., organized. W. T. Stahl, president; W. G. McCormick, vice-president; W. G. Comfort, Westville, I. T., secretary; H. O. Beeson, Pineville, Mo., treasurer.

North Shore Telephone Company, Port Jefferson, N. Y., organized. Capital stock, $7,500. Directors, Frank H. Tuthill, Rocky Point; W. A. Davis, Mount Sinai; C. A. Squires, Echo; J. H. Davis, H. T. Bayles, John E. Overton, Charles V. Platt and Ralph J. Hawkins, Port Jefferson; Thomas N. Bayles, Stony Brook.

Independent Telephone Clearing Association, Sherman, N. Y. Capital stock, $5,000. Directors, Fred N. Randall, Ripley; Walter H. Homewood, Sherman; Herbert H. Corbett, Sherman; Otis L. Ingalls, Westfield; George S. Beebe, Silver Creek; Ralph H. Hall, Fredonia; Thaddeus S. Lane, Jamestown; George W. Appleby, Watts Flats; Arthur R. Matun, Fredonia; Edward J. Griswold, Mayville.